

Monsanto

LAW DEPARTMENT

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63167
Phone: (314) 694-1000

February 3, 1995

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Lance R. Richman, P.G.
Emergency and Remedial
Response Division
U.S. Environmental Protection
Agency
26 Federal Plaza, Room 13-100
New York, NY 10278

RE: Request for Information Under 42 U.S.C. §9601 et seq.
Diamond Alkali Superfund Site, Passaic River Study Area

Dear Mr. Richman:

Monsanto Company hereby timely responds to the United States Environmental Protection Agency's (EPA) Request for Information under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area, dated January 3, 1995. Monsanto received the Information Request on January 4, 1995.

In response to the EPA's Request for Information, Monsanto disagrees with the EPA's overly broad assumption of authority which it asserts is conferred by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC Section 9601, et seq. Monsanto also objects to the overly broad scope of the questions included within the EPA's Request for Information; to the unreasonable time period which is not specified in the Information Request; and to the lack of definition or limitation with reference to the Passaic River Study Area. In thus responding, Monsanto is not waiving any right by such action to the apparent lack of authority in issuing the January 3, 1995 letter. The unintelligible signature does not relate delegation of authority to issue such a government request and, therefore, this reply is filed under protest without any waiver of any right

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or objection relative to Monsanto Company's cooperation. Other and further objections and claims of privilege, both general and specific, are noted in Monsanto's responses to the specific requests.

However, consistent with Monsanto's policy of cooperation with government agencies, Monsanto is responding to the non-objectionable, non-privileged portions of EPA's Request for Information. At the same time, Monsanto reserves all objections and defenses as to EPA's statement of authority and the scope of information as requested.

Because of the all encompassing scope of the EPA's Request for Information, Monsanto needs and requests the assistance of the EPA in preparing its response. Accordingly, Monsanto requests, under the provisions of the Freedom of Information Act, that the EPA prepare and copy all information showing or tending to show that Monsanto or any of its manufacturing or business activities have any connection whatsoever to the Diamond Alkali Superfund Site or the Passaic River Study Area and, further, any and all information upon which the EPA relies in its decision to submit the Information Request to which Monsanto makes the within response. Monsanto requests that the appropriate Freedom of Information officer contact the undersigned counsel to make arrangements for delivery of the responsive documents.

Monsanto's Response is submitted herewith, attached and marked as "Exhibit A." Other exhibits are referenced therein and also attached. Monsanto hereby asserts a claim of business confidentiality as to the information contained in all documents and exhibits submitted herewith pursuant to 40 CFR Part 2, subpart B. Where appropriate, the cover sheets to the information are marked in accordance with 40 CFR section 2.203(b).

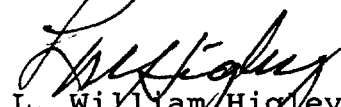
Given the extensive scope of information as requested, and given the effort required to review and make diligent search for responsive information, Monsanto reserves the right to amend and/or to supplement this response as appropriate in the future upon the discovery of further documents and information. Specifically, it must be noted that Monsanto's responses herein may encompass information supplied in the documentation which has been previously produced by Monsanto for EPA's inspection in compliance with an Administrative Order pertaining to an ECRA study, the report of which is dated October 25, 1991.

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Please direct all further inquiries, or questions concerning Monsanto's position in this matter or any information submitted herewith to the undersigned counsel at (314)694-8503.

Very truly yours,

A handwritten signature in dark ink, appearing to read "L. William Higley", is written over the typed name.

L. William Higley
Assistant Environmental Counsel

LWH/sgf/255

850130003

EXHIBIT A

Monsanto's Response to Request for Information Concerning the Diamond Alkali Superfund Site Passaic River Study Area

GENERAL OBJECTIONS

Monsanto generally objects to the overly broad, unauthorized and unduly burdensome nature of the questions included in the January 3, 1995 Request for Information on the site referenced above, as propounded by the United States Environmental Protection Agency (EPA). Monsanto objects to the extreme breadth of information sought insofar as the questions fail to limit the scope of inquiry to the discharge of hazardous substances, as defined in 42 US Code section 9601(14) (hazardous substance), into the Passaic River. The questions as propounded are in excess of EPA's authority for purposes of information requests under CERCLA Section 104(e) concerning a hazardous waste site. Furthermore, there is no showing that the individual propounding these requests on behalf of EPA possesses the requisite authority to make such requests pursuant to CERCLA. The illegible signature does not relate any delegation of authority to issue such a Government Request. Monsanto also objects to the definitions and instructions included in the Request for Information on the grounds that they exceed the scope of EPA's authority for purposes of such an Information Request.

Given the undefined and unlimited periods of time for which inquiry is made, the undefined nature of questions and the existence of multiple lawsuits which may pertain to some aspects of the questions as propounded (including but not limited to Monsanto Company vs. the Aetna Casualty & Surety Company, et al., C.A. No. 88C-JA-118-1-CV, Superior Court, New Castle County, Delaware), various communications and documents are not subject to disclosure on the basis of irrelevance, over breadth, lack of competent authority, attorney-client communications, attorney work product, self-critical analysis and/or settlement negotiations privileges.

Monsanto states that the objections set forth above are continuing in nature, and to the extent applicable, shall be deemed included in each and every answer given below, whether or not specifically set forth therein. Monsanto specifically reserves to itself and does not waive the right to raise additional objections as appropriate at any later time.

RESPONSES

1) How long has your company operated at the facility designated above? If your company no longer operates at this facility, during what years did your company operate at the facility?

Response Number 1:

Monsanto operated the Kearny Plant from 1954 to 1991.

2) a) Does your company have or has it in the past had a permit or permits issued pursuant to the Resource Conservation and Recovery Act, 42 U.S.C. §6901 et seq.? If "yes", please provide the years that your company held such a permit and its EPA Identification Number.

b) Does your company have or has it in the past had a permit or permits issued pursuant to the Federal Water Pollution Control Act, 33 U.S.C. § 1251, et seq.? If "yes", please provide the years that your company held such a permit.

Response Number 2:

a) No RCRA permit was required.

b) No Federal Water Pollution Control Act permit; the plant was not a direct discharger and all such sewer discharges since 1955 went to POTW.

3) Did your company receive, utilize, manufacture, discharge, release or dispose of any materials containing the following substances:

	Yes	No
2,3,7,8 tetrachlorodibenzo-p-dioxin		
or other dioxin compounds		
Polychlorinated biphenyls (PCBs)		
3-Ethyl-methyl hexane		
Methylcyclopentane		
Bis(1,1-dimethylethyl)-diazine		
2,2-Dimethylbenzene		
Trichloroethene		
3,3-Dimethyl hexynol		
2,2,4-Trimethylhexane		
Toluene		
2,3-Dimethylhexane		
Naphthalene		

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2,3-Dimethylheptane

Response Number 3:

In addition to the previously stated general objections, Monsanto specifically objects to the form of Request Number 3 insofar as its "checklist" format listing of various chemicals attempts to force Monsanto to characterize transactions for use of chemicals in such a way as to correspond to the elements of CERCLA liability. Without waiver of these objections above stated, Monsanto states that the Kearny Plant used polychlorinated biphenals (PCB's) as a heat transfer fluid and toluene as a raw material in manufacturing processes. Monsanto denies that it discharged hazardous waste into the Passaic River from the Kearny Plant.

4) a) Provide a description of the manufacturing processes for which all hazardous substances, including, but not limited to, the substances listed in response to item (3), were a product or by-product.

b) During what parts of the manufacturing processes identified in the response to items (4)(a), above, were hazardous substances, including, but not limited to, the substances listed in response to item (3), generated?

i) Describe the chemical composition of these hazardous substances.

ii) For each process, what amount of hazardous substances was generated per volume of finished product?

iii) Were these hazardous substances combined with wastes from other processes? If so, wastes from what processes?

Response Number 4:

a) Monsanto restates the general objections set forth above and specifically objects to Request Number 4 and all its subparts on the grounds that inasmuch as Monsanto did not discharge hazardous waste into the Passaic River, Request Number 4(a) is over broad and unreasonably burdensome and calls for irrelevant and immaterial information.

Subject to the foregoing objection, Monsanto states that a description of the manufacturing processes at the Kearny Plant is contained in a document entitled "Site Evaluation Study", (October 25, 1991) Attachment

5 thereof, a copy of which is attached hereto and marked Exhibit B.

- b) Monsanto incorporates herein by reference its objections and responses to Response Number 4(a), and all exhibits thereto, as stated herein immediately above.

5) Describe the methods of collection, storage, treatment, and disposal of all hazardous substances, including, but not limited to, the substances listed in response to item (3) and (4), Include information on the following:

- a) Identify all persons who arraigned [sic] for and managed the processing, treatment and disposal of hazardous substances.

- b) If hazardous substances were taken off-site by a hauler or transporter, provide the names and addresses of the waste haulers and the disposal site locations.

- c) Describe all storage practices employed by your company with respect to all hazardous substances from the time operations commenced until the present. Include all on-site and off-site storage activities.

Response Number 5:

Response (a) through (c):

Monsanto objects to Request Number 5 on the general grounds as stated above, and, in addition, objects to Request Number 5 inasmuch as it exceeds the scope of EPA's authority for purposes of an Information Request under Section 104(e) of CERCLA. Monsanto further objects to the over broad and unreasonably burdensome nature of Request Number 5 inasmuch as Monsanto denies that it discharged hazardous waste into the Passaic River. Subject to the foregoing objections, however, Monsanto submits the Site Evaluation Study Report and Attachment 5 thereof, all of which is attached hereto and marked Exhibit B.

6) a) For process waste waters generated at the facility which contained any hazardous substances, including, but not limited to, the substances listed in response to item (3) and (4):

- i) Did the waste stream connect to a sanitary sewer and if so, during what years?

- ii) Were they treated before being discharged to the sanitary sewer and if so, how?
 - iii) If the waste waters were not discharged to the sanitary sewer, where were they disposed and during what years?
- b) For floor drains or other disposal drains at the facility:
 - i) Did the waste stream connect to a sanitary sewer and if so, during what years?
 - ii) Was the waste stream treated before being discharged to the sanitary sewer and if so, how?
 - iii) If the floor drains or other disposal drains at the facility were not discharged to the sanitary sewer, where did they discharge and during what years?
- c)
 - i) Did any storm sewers, catch basins or lagoons exist at any time at the facility and if so, during what years?
 - ii) If catch basins or lagoons existed, were they lined or un-lined?
 - iii) Where was the discharge from any of these structures released and during what years? Was this discharge treated before its release and if so, how and during what years?
- d) Please supply diagrams of any waste water collection or disposal systems on the property.

Response Number 6:

Monsanto restates and incorporates herein by reference the general objections set forth above and, in addition, specifically objects to the over broad and unreasonably burdensome nature of Request Number 6 on the grounds that it is not defined or limited in time or with reference possible to discharge of hazardous materials to the Passaic River. Subject to and without waiving the foregoing objections, Monsanto states in response to all of the multiple subparts of Request Number 6 that the Kearny Plant was an indirect discharger to a POTW. Request Number 6 is further rendered ambiguous because the term "sanitary sewer" is not defined. To the extent that the location of waste streams, storm sewers, catch basis for lagoons are treated therein, Monsanto refers the EPA to the Site Evaluation Study Report,

dated October 25, 1991, and all attachments thereto, a copy of which is attached hereto and marked Exhibit B and the Preliminary Remedial Investigation Report, attached hereto as Exhibit C.

7) a) For each hazardous substance, including, but not limited to, the substances listed in response to item (3) or (4), identified in the responses to item (4), above, provide the total amount generated during the operation of the facility on an annual basis.

b) Were any hazardous substances, including, but not limited to, the substances listed in response to item (3) or identified in the responses to item (4), above, disposed of in the Passaic River or discharged to the Passaic River? If yes, estimate the amount of material discharged to or disposed of in the Passaic River and the frequency with which this discharge or disposal occurred.

Response Number 7:

Monsanto restates and incorporates herein by reference its general objections as stated above. Further, Monsanto specifically objects to Request Number 7 and all subparts thereof on the grounds that they are not limited or defined in period of time or in terms of reference to discharge or release of hazardous substances to the Passaic River. Further, to the extent that records or documents are subject to normal record retention procedures carried out in the normal course of business, documents which may be responsive to Request Number 7(a) may no longer exist.

As to subpart (b), and subject to the foregoing objections, Monsanto denies that it discharged hazardous wastes into the Passaic River.

8) Please identify any leaks, spills, explosions, fires, or other incidents of accidental material discharge that occurred at the facility during which or as a result of which any hazardous substances, including, but not limited to, the substances listed in response to item (3) or (4), were released on the property of the facility or discharged to the Passaic River. Provide any documents or information relating to these incidents.

Response Number 8:

Monsanto restates and incorporates herein by reference its general objections as stated above. In addition, Monsanto specifically objects to Request Number 8 on the grounds that it

is unreasonably burdensome and over broad in that it calls for irrelevant and immaterial information. Monsanto further objects because Request Number 8 is not limited in terms of period of time or in terms of reference to spill or discharge to the Passaic River.

Subject to and without waiving the foregoing objection, Monsanto refers the EPA to the attached Evaluation Study, dated October 25, 1991 (Exhibit B) and the Preliminary Remedial Investigation Report dated August 30, 1991 (Exhibit C).

9) Provide the date of any leaks, spills, explosions, fires or other incidents of accidental material discharge of any hazardous substances, including, but not limited to, the substances listed in response to item (3) and (4), on the property or into the waste water discharge system at the facility. Provide details of the ultimate disposal of any contaminated materials.

Response Number 9:

Monsanto restates and incorporates herein by reference its objections and response to Request Number 8 as if stated and set forth herein.

10) a) Was your facility ever subject to flooding. If so, was the flooding due to:

i) overflow from sanitary or storm sewer back-up, and/or

ii) flood overflow from the Passaic River?

b) Please provide the date and duration of each flood event.

Response Number 10:

Monsanto restates and incorporates herein by reference its general objections stated herein above. In addition, Monsanto specifically objects to Request Number 10 insofar as, and to the extent that it is not limited with reference to or in terms of a discharge, or release of hazardous materials to the Passaic River. Subject to the foregoing objections, Monsanto states that it has reason to believe that the Passaic River overflowed its banks during the winter and spring of 1992-1993, but that all manufacturing and storage facilities were dismantled at that time and no flooding occurred in any former production or storage areas. Further information may be found in the attached Site

Evaluation Study, Exhibit B hereto, and the Preliminary Remedial Investigation Report, August 30, 1991, Exhibit C hereto.

11) Please provide a detailed description of any civil, criminal or administrative proceedings against your company for violations of any local, State or federal laws or regulations relating to water pollution or hazardous waste generation, storage, transport or disposal. Provide copies of all pleadings and depositions or other testimony given in these proceedings.

Response Number 11:

Monsanto restates and incorporates herein by reference its general objections stated herein above. In addition, Monsanto specifically objects to Request Number 11 on the grounds that it calls for irrelevant and immaterial information, and is unreasonably burdensome and over broad in its scope inasmuch as it is neither limited in time nor limited in location of the plant's ownership. Further, Request Number 11 bears no relationship to any study of discharge or spill of any hazardous materials to the Passaic River. Subject to the foregoing objection, however, Monsanto states that the Site Evaluation Study, dated October 25, 1991, may contain information in response to this Request Number 11.

12) Provide a copy of each document which relates to the generation, purchase, use, handling, hauling, and/or disposal of all hazardous substances, including, but not limited to, the substances listed in response to item (3) and (4). If you are unable to provide a copy of any document, then identify the document by describing the nature of the document (e.g. letter, file memo, invoice, inventory form, billing record, hazardous waste manifest, etc.). Describe the relevant information contained therein. Identify by name and job title the person who prepared the document. If the document is not readily available, state where it is stored, maintained, or why it is unavailable.

Response Number 12:

Monsanto restates and incorporates herein by reference its general objections set forth herein above. In addition, Monsanto objects to Request Number 12 on the grounds that it is unreasonably burdensome and over broad inasmuch as it is not limited or defined in period of time to which it refers nor in terms of relevance to or connection with discharge or release of hazardous substances to the Passaic River. Accordingly, Request Number 12 calls for irrelevant and immaterial information. Further, all documents which are potentially relevant to this

inquiry, assuming it were not objectionable, are subject to Monsanto record retention procedures in the normal course of business and, accordingly, may no longer exist. Subject to foregoing objection, Monsanto denies that it discharged hazardous waste into the Passaic River.

13) a) Provide all documents, including the "Remedial Investigation Report for Monsanto's Kearny New Jersey Plant", "Report for Interim Remedial Measures" and the "Feasibility Study" generated in fulfillment of the requirements of the New Jersey Department of Environmental Protection Administrative Order on Consent executed on July 24, 1989.

b) Provide all other documents pertaining to the results of any analyses of ground water, surface water, ambient air, and any other environmental media performed at the facility.

Response Number 13:

Monsanto restates and incorporates herein its general objections as stated herein above. Further, Monsanto specifically objects to Request Number 13 and all subparts thereof on the grounds that they are unreasonably burdensome and over broad in that they are undefined and unlimited by periods of time or in terms of any connection with discharge or release of hazardous substances to the Passaic River. Subject to the foregoing objections, Monsanto has enclosed herein the "Remedial Investigation Report for Monsanto's Kearny New Jersey Plant", a copy of which is attached hereto and marked Exhibit C; the "Report for Interim Remedial Measures", a copy of which has not been found, but will be furnished by supplemental response and marked Exhibit D when it is located; and the "Feasibility Study", a copy of which is attached hereto and marked Exhibit E, generated in fulfillment of the requirements of the New Jersey Department of Environmental Protection Administrative Order on Consent executed on July 24, 1989.

14) a) Has your company owned the facility at the location designated above? If so, from whom did your company purchase the property and in what year? If your company subsequently sold the property, to whom did your company sell it and in what year? Please provide copies of any deeds or documents of sale.

b) If your company did not own the facility, from whom did your company rent the facility and for what years? Please provide copies of any rental agreements.

c) To the extent that you know, please provide the names of all parties who owned or operated the facility during the period from 1940 through the present. Describe the relationship, if any, of each of those parties with your company.

Response Number 14:

Monsanto restates and incorporates herein by reference its general objections as stated and set forth herein above. In addition, Monsanto specifically objects to Request Number 14 and all of the subparts thereof on the grounds that they are not limited in terms of discharge or release of hazardous materials to the Passaic River. Subject to the foregoing objections, Monsanto responds as follows:

- (a) Monsanto purchased the property from the Pennsylvania Railroad in 1954. Monsanto sold the property to the Motor Carriers Service Corp. in December of 1994.
- (b) Not applicable.
- (c) Other than subpart (a), above, Monsanto does not have information with which to respond to subpart (c).

15) Answer the following questions regarding your business or company. In identifying a company that no longer exists, provide all the information requested, except for the agent for service of process. If your company did business under more than one name, list each name.

- a) State the legal name of your company.
- b) State the name and address of the president or the chairman of the board, or other presiding officers of your company.
- c) Identify the state of incorporation of your company and your company's agent for service of process in the state of incorporation and in New Jersey.
- d) Provide a copy of your company's "Certificate of Incorporation" and any amendments thereto.
- e) If your company is a subsidiary or affiliate of another company, or has subsidiaries, or is a successor to another company, identify these related companies. For each related company, describe the relationship to your company; indicate the date and manner in which each relationship was established.

- f) Identify any predecessor organization and the dates that such company became part of your company.
- g) Identify any other companies which were acquired by your company or merged with your company.
- h) Identify the date of incorporation, state of incorporation, agents for service of process in the state of incorporation and New Jersey, and nature of business activity, for each company identified the responses to items (11)(e), (f), and (g), above.
- i) Identify all previous owners or parent companies, address, and the date change in ownership occurred.

Response Number 15:

Monsanto incorporates herein and restates its general objections as stated and set forth herein above. In addition, Monsanto specifically objects to Request Number 15 and all subparts thereof on the grounds that they are over broad and unreasonably burdensome and exceeding EPA's authority under Section 104(e) of CERCLA.

Monsanto restates and incorporates herein by reference its general objections to Request Number 15 as stated herein above. In addition, Monsanto specifically objects to Request Number 15 and all subparts thereof as being overly broad, unreasonably burdensome and as exceeding EPA's authority for Information Requests under CERCLA. Nevertheless, and without waiver of the foregoing objections, Monsanto Company responds that it is incorporated in the state of Delaware, is publicly traded, and that its registered agent for the service of process in Delaware is the Corporation Trust Company. Monsanto Company was incorporated in 1933 and is the successor to Monsanto Chemical Works, a Missouri Corporation incorporated in 1901. Monsanto Company operated under the name Monsanto Chemical Company until 1964, which remains the name of a divisional operating unit. The directors and officers of Monsanto Company are identified in the enclosed Form 10-K filings. Any contact with any Monsanto employee, officer or director must be made through the undersigned counsel, L. W. Higley, Monsanto Company (314)694-8503. The attached Form 10-K filings made with the Securities and Exchange Commission for the past three years adequately provide assurance of Monsanto's financial capabilities. Monsanto was not and is not now a subsidiary of any other company. All subsidiary corporations are identified in the attached Form 10-K filings. The said 10-K filings are attached hereto and marked Exhibit F.

16) Provide the name, address, telephone number, title and occupation of the person(s) answering this "Request for Information" and state whether such person(s) has personal knowledge of the responses. In addition, identify each person who assisted in any way in responding to the "Request for Information" and specify the question to which each person assisted in responding.

Response Number 16:

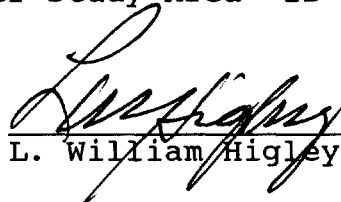
Monsanto restates and incorporates herein by reference its general objections as stated herein above. In addition, Monsanto specifically objects to Request Number 16 on the grounds that it calls for information protected by the Attorney-Client and Attorney Work Product privileges. Subject to the foregoing objections, Monsanto answers as follows: These responses and objections were prepared under the direction of L. W. Higley, Assistant Environmental Counsel, Monsanto Company, 800 N. Lindbergh Boulevard, St. Louis, Missouri. The following individuals participated in various degrees in the preparation of these responses, under the direction of Mr. Higley:

J. P. Hyland; J. D. Felder; N. N. Rozell; K. D. Moldthan; 800 N. Lindbergh Boulevard, St. Louis, Missouri, 63167; telephone number (314)694-8503; C. A. Balan, North Bergen, New Jersey, 07047; telephone number (via Mr. Higley) (314)694-8503.

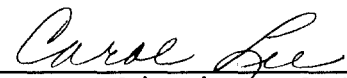
VERIFICATION

STATE OF MISSOURI)
)
COUNTY OF ST. LOUIS) ss.

L. William Higley, being duly sworn, deposes and says that he has read the foregoing "Monsanto's Response to Request for Information Under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area" and is familiar with the contents thereof; that the deponent is without personal knowledge of the matters stated in the foregoing "Monsanto's Response to Request for Information Under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area"; that the foregoing "Monsanto's Response to Request for Information Under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area" has been assembled by authorized employees and counsel of Monsanto Company who have informed deponent that the foregoing "Monsanto's Response to Request for Information Under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area" is true; and that to the best of deponent's knowledge this "Monsanto's Response to Request for Information Under 42 U.S.C. §9601 et seq. Diamond Alkali Superfund Site, Passaic River Study Area" is true.


L. William Higley

Subscribed and sworn to before me
this 3rd day of February, 1995.



Notary Public in and for said
County and State

CAROL LEE
Notary Public — Notary Seal
STATE OF MISSOURI
JEFFERSON COUNTY
My Commission Expires: February 23, 1997

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EXHIBIT B

**SITE EVALUATION SUBMISSION
ECRA CASE FILE NO. 91565**

**Monsanto Kearny Plant
Kearny, New Jersey**

October 25, 1991

Prepared for:

**Monsanto Company
Kearny, New Jersey**

Prepared by:

**ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066**



NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT
INDUSTRIAL SITE EVALUATION ELEMENT
CN 028, TRENTON, N.J. 08625

ENVIRONMENTAL CLEANUP RESPONSIBILITY ACT (ECRA)

INITIAL NOTICE

SITE EVALUATION SUBMISSION (SES)

This is the second part of a two-part application form. This information must be submitted within 45 days following any applicable situation as specified at N.J.A.C. 7:26B-1.5 or any triggering event as specified at N.J.A.C. 7:26B-1.6. Please refer to the instructions and N.J.A.C. 7:26B-3.2 before filling out this form. Answer all questions. Should you encounter any problems in completing this form, we recommend that you discuss the matter with a representative from the Element. Submitting incorrect or insufficient data may cause processing delays and possible postponement of your transaction. Please call (609) 633-7141 between the hours of 8:30 a.m. and 4:30 p.m. to request assistance.

PLEASE PRINT OR TYPE

Date October 25, 1991

I. Industrial Establishment

Name Monsanto Company, Kearny Plant

Address Foot of Pennsylvania Avenue

City or Town Kearny New Jersey Zip Code 07032

Municipality Kearny County Hudson

A. Operational and Ownership History: (Attach additional sheets if necessary) See Attachment 1-A

<u>Name</u>	<u>Owner/ Operator</u>	<u>From</u>	<u>To</u>	<u>Current Address</u>

B. Brief description of past operation(s) conducted on site (Attach additional sheets if necessary) See Attachment 1-

ECRA-002
12/87

2. List all federal and state environmental permits applied for, or received, or both, at this facility (*Attach additional sheets if necessary*)

Check here if no permits are involved _____

A. New Jersey Bureau of Air Pollution Control See Attachment 2-A

Permit Number	Certificate Number	Date of Approval or Denial	Reason for Denial (if applicable)	Expiration Date
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

B. New Jersey Pollutant Discharge Elimination System (NJPDDES) Not Applicable

Number	Discharge Activity	Date Issued or Denied	Expiration Date	Body of Water Discharged Into
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

C. United State Environmental Protection Agency (EPA) Identification Number and copy of the most recent generator Annual Report prepared pursuant to the New Jersey Hazardous Waste Regulations. (*If applicable*)

ID # NJD002444933

Is a copy of the Annual Report attached? X Yes (See Attachment # 2-C) No

D. Resource, Conservation, Recovery Act (RCRA) Permit # Not Applicable

E. Bureau of Underground Storage Tank Registration Number(s) Not Applicable, No existing USTs

F. All other federal, state, local governmental permits.

Agency Issuing Permit	Permit No.	Date of Approval or Denial	Expiration Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Passaic Valley Sewerage Commissioners 15406752 11/13/90 11/13/95

ECRA-002
12/87

3. Summary of Enforcement Actions for Violation of Environmental Laws or Regulations: See Attachment 3

Check here if no enforcement actions are involved _____

A. Date of Action _____

Section of Law or Statute violated _____

Type of Enforcement Action _____

Description of the Violation _____

How was the violation resolved? _____

B. Date of Action _____

Section of Law or Statute violated _____

Type of Enforcement Action _____

Description of the Violation _____

How was the violation resolved? _____

4. Site Map

See Attachment 4

Is this map enclosed? _____ Yes (See Attachment # _____) _____ No

If No, state the reason _____

(Attach additional pages, if necessary)

5. Description of Operations:

Is this report enclosed? ☒ Yes (See Attachment # 5) ☐ No

If No, state the reason _____

6. Description of Building Heating System:

A. How is the Industrial Establishment currently heated? (Oil, Gas, Electric) Gas and oil.

How long has the Industrial Establishment been heated by the above fuel/energy source: 36 years

B. Was the Industrial Establishment heated by fuel oil at any time: ☒ Yes ☐ No

Is information on the decommissioning of underground fuel oil tanks included with item No. 14 of this form?

☐ Yes ☒ No If no, explain below: All fuel oil tanks have been installed
above ground.

C. Are the results of the Integrity Evaluation for Existing Underground Fuel Oil Tanks enclosed?

☐ Yes (See Attachment # _____) ☒ No If no, state the reason There are no existing
USTs on site.

7. Summary of Industrial Establishment Wastewater Discharges of Sanitary and/or Industrial Waste: See Attachment

A. Discharge Period
From To

Discharge Type

Treatment By

<u>11/13/90</u>	<u>Present</u>	<u>Industrial and Sanitary</u>	<u>Oil/Water Separator/Public Treatn</u>
<u>1940</u>	<u>1990</u>	<u>Industrial and Sanitary</u>	<u>Public Treatment Works</u>

B. If the Industrial Establishment discharges sanitary and/or industrial wastes to a publicly-owned treatment plant, provide the name/address of that facility.

Name Passaic Valley Sewerage Commissioner Telephone # (201) 344-1800

Street Address Industrial Waste Control Department, 600 Wilson Boulevard

Municipality Newark State NJ Zip Code 07105

Date(s) of Discharge

Nature of Discharge

- 11/13/90 to present
- 1940 to 11/13/90
-

Industrial (Pretreated by Oil/Water Separator)
and Sanitary.
Industrial and Sanitary

8. Hazardous Substance and Waste Containment Description: *(Attach additional sheets if necessary)*

See Attachment 8

Type of Storage Unit	Date Installed	Area or Volumetric Capacity (include units)	Material Stored	Construction Type	Location Reference	Decommissioning or Sampling Reference

9. Hazardous Substance/Waste Inventory:

See Attachment 9

Material Name	Quantity (indicate units)	Location Reference	Storage Method Container Type/Size	Typical Annual Usage	To Remain on Site (Yes or No)

850130019

10. Discharge History of Hazardous Substances and Wastes:

- A. Have there been any discharges of hazardous substances and wastes?
 X Yes (Complete Item B below) No (Go to Item 10C)

B. Summary of Discharges and Resolutions

<u>Description of Discharge Event</u>	<u>Response and Resolutions</u>
See Attachment 10-B	

- C. Is this Industrial Establishment subject to Spill Prevention Control and Countermeasure (SPCC) per 40 CFR Part 112 or Discharge Prevention, Containment and Countermeasure (DPCC) Plan per NJAC 7:1E-4.1 requirements?

 X Yes No A copy of the Plan(s) may be required at the discretion of the Department.

11. Sampling Plan Proposal

- A. Is sampling proposed at the facility? Yes (See Attachment #) No X

If sampling is not proposed, please explain below. (*Attach additional sheets if necessary*)

See Attachment 11-A

- B. Is groundwater sampling proposed? Yes X No See Attachment 11-A

Note: If groundwater sampling is proposed under the plan, you must complete ECRA Form 002A "Request for Hydrogeologic Assessment" and submit it with the application.

12. Decontamination/Decommissioning Plan

A. Is the facility Decontamination/Decommissioning Plan enclosed?

☒ Yes (See Attachment # 12-A) ☐ No

B. If no, specify why decontamination/decommissioning is not considered necessary.

13. Historical Data on environmental quality at the Industrial Establishment

A. Were sampling results obtained on Environmental Quality for the Industrial Establishment?

☒ Yes (See Attachment # 13) ☐ No

B. If sampling results were obtained but are not part of this application, please explain below:

Not Applicable

14. List any other information you are submitting or which has been formally requested by the Department:

<u>Description</u>	<u>Attachment #</u>
<u>Description of Aesbestos containing material (ACM)</u>	<u>14</u>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

FEE CHECKLIST

Include below a breakdown of the total fee submitted with this application. (See N.J.A.C. 7:26B-1.10 for the appropriate fees.)

<u>Item</u>	<u>Amount (\$)</u>
1. Initial Notice Review	
i. Without Sampling Plan	<u>* \$2,000</u>
ii. With Sampling Plan that includes only underground storage tank analysis without groundwater monitoring	<hr/>
iii. With Sampling Plan other than ii. above or iv. below	<hr/>
iv. With Sampling Plan that includes any groundwater monitoring	<hr/>
2. Sampling Data Review	<hr/>
3. Negative Declaration Review	<hr/>
4. Cleanup Plan Review	<hr/>
5. Oversight of Cleanup Plan Implementation	<hr/>

TOTAL FEE ENCLOSED \$ \$0.00ARE FEES ENCLOSED? ☐ YES

* \$2,000 was submitted with the GIS on September 11, 1991.

CERTIFICATIONS:

- A. The following certification shall be signed by the highest ranking individual at the site with overall responsibility for that site or activity. Where there is no individual at the site with overall responsibility for that site or activity, this certification shall be signed by the individual having responsibility for the overall operation of the site or activity.

I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of N.J.S.A. 13:1K-6 et seq., I am personally liable for the penalties set forth at N.J.S.A. 13:1K-13

Typed/Printed Name Ronald P. Panasiewicz Title Plant Manager

Signature _____ Date _____

Sworn to and Subscribed Before Me

on this _____
Date of _____ 19 ____

Notary

- B. The following certification shall be signed as follows:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, Federal or other public agency, by either a principal executive officer or ranking elected official.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate, or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of N.J.S.A. 13:1K-6 et seq., I am personally liable for the penalties set forth at N.J.S.A. 13:1K-13

Typed/Printed Name Thomas H. Lafferre Title Vice President Operations/
Corporate Vice President

Signature _____ Date _____

Sworn to and Subscribed Before Me

on this _____
Date of _____ 19 ____

Notary

ATTACHMENTS

- 1-A Operational and Ownership History (Item 1.A)
- 1-B Brief Description of Past Operations (Item 1.B)
- 2-A New Jersey Bureau of Air Pollution Control Permits (2.A)
- 2-C Copy of Generator's Annual Report (Item 2.C)
 - 3. Summary of Enforcement Actions of Environmental Laws and Regulations (Item 3)
 - 4. Current and Historic Site Maps (Item 4)
 - 5. Description of Past and Current Site Operations (Item 5)
 - 7. Description of Past and Current Industrial and Sanitary Waste Water Discharge (Item 7)
 - 8. Description of Current and Historical On-Site Containment of Hazardous Substances and Waste (Item 8)
 - 9. Current On-Site Hazardous Substance/Waste Inventory (Item 9)
- 10-B Discharge History of Hazardous Substances and Wastes (Item 10)
- 11-A Justification for No Sampling Plan Submission (Item 11)
- 12-A Decontamination/Decommissioning Plan (Item 12)
- 13-A Summary Tables of Historic Analytical Data with Location Maps (Item 13)
- 13-B Summary of Roux Associates, Inc. Remedial Investigation Data for Ground-Water Samples with Location Maps (Item 13)
- 13-C Summary of Roux Associates, Inc. Remedial Investigation Data for Subsurface Soil Samples with Location Maps (Item 13)
- 13-D Summary of Roux Associates, Inc. Remedial Investigation Data for Surface Soil Samples with Location Maps (Item 13)
- 14. Description of Asbestos Containing Material (Item 14)

ATTACHMENT 1-A

Operational and Ownership History (Item 1.A)

Operational/Ownership History

Company Name	Owner/Operator	Operation Dates		Current Address
		From	To	
Pennsylvania Railroad	United New Jersey Railroad and Canal Company/Pennsylvania Railroad Company	1940	1954	Not available
Monsanto Chemical Co.	Monsanto Chemical Co. ¹	1954	Present	Monsanto Company 800 N. Lindbergh Boulevard St. Louis, Missouri 63167

¹ American President Intermodal Co., Ltd. (API), 1800 Harrison Avenue, Oakland CA. 94612 leases approximately 8 acres (or one quarter of total property) from 1988 to present.

850130025

ATTACHMENT 1-B

Brief Description of Past Operations (Item 1.B)

Brief Description of Past Operations

Year	Activity
1954	Monsanto purchased property.
1955	Phosphoric Acid and sodium tripolyphosphate (STP) production begins.
1956	Sterox® production begins.
1960	Alkylphenol production begins.
1966	Second units of phosphoric acid and STP production begin.
1967	Vinyl siding extrusion begins.
1970	Vinyl siding extrusion terminates.
1976	Warehousing and distribution services begin.
1983	Older STP unit production terminates.
1985	All phosphate manufacturing (phosphoric acid and STP) terminates and units are dismantled.
1988	Part of property is leased to API, a trucking company, which uses the property as a trucking terminal.
1990	Sterox® production is terminated.
1991	AP production is terminated.

ATTACHMENT 2-A

New Jersey Bureau of Air Pollution Control Permits (2.A)

List New Jersey Bureau of Air Pollution Control¹

Permit/Certificate Number	Date of Approval/Denial	Reason for Denial	Expiration Date	Status	Item #²	Description
16135	1981	N/A	3/11/90	D	479	#1 STP Granular System Dust Collector
37205	N/A	N/A	6/20/94	U	505	Nonene Storage Tank Vent
37206	N/A	N/A	4/4/93	U	506	Propylene Tetramer Storage Tank Vent
9405	1981	N/A	1/16/89	D	513	#2 STP Soda Ash Dust Collector
21410	1981	N/A	3/27/88	D	706	#2 STP Impact Mill Dust Collector
21514	1981	N/A	10/14/86	D	719	#2 STP Blender Dust Collector
35376	1981	N/A	9/15/88	D	916	#2 STP Bagging System Dust Collector
63042	1981	N/A	12/27/92	U	3100	Maleic Anhydride Storage Tank Vent
041591	N/A	N/A	1/12/94	U	PT Tank	Propylene Tetramer Storage Tank Vent (573,000 Gallons)
22894	N/A	N/A	12/12/88	D	590	Fuel Oil Storage Tank (700,000 gallons)
35378	1981	N/A	10/30/87	D	96	#1 Soda Ash Dust Collector
37204	1981	N/A	10/1/88	D	AMS	Alpha Methyl Styrene Storage Tank Vent
52196 (7782) ⁴	1981	N/A	11/6/91 ³	U	1	STP Powder Loading Dock #1
52197 (7781) ⁴	1981	N/A	11/6/91 ³	U	2	STP Powder Loading Dock #2
63296	1981	N/A	7/13/91	D	14,25	#1 STP Mixer and Dryer Exhaust Vent
21515	1981	N/A	4/30/88	D	68	#1 STP Bagging System Dust Collector
41615	1981	N/A	12/3/89	D	138	Hydrogen Sulfide Scrubber
35377	1981	N/A	5/7/88	D	440	#1 STP Rotary Cooler Dust Collector
079780 ⁵	1990	N/A	1/10/90	C	#1 Boiler Room	#1 Boiler
To be provided by NJDEP	1991	N/A	N/A	I	Sterox® Reactor	Sterox® EO Decontamination (Temp)

¹ Other stacks registered with Hudson County are designated on Stack plan.

² The items numbers indicate locations which are presented on Stack plan B-1. Non-permitted stacks (which were "grandfathered") are not shown on the Stack plan.

³ A renewal application was submitted in 9/91.

⁴ Permit/Certificate Number in parentheses refers to former permit numbers.

⁵ Temporary Permit was canceled, after used for temporary pilot study. A letter was sent to NJDEP to cancel permit.

⁶ Tank approved for Nonene on 4/23/91.

N/A = Not Available

Codes for Stack Status:

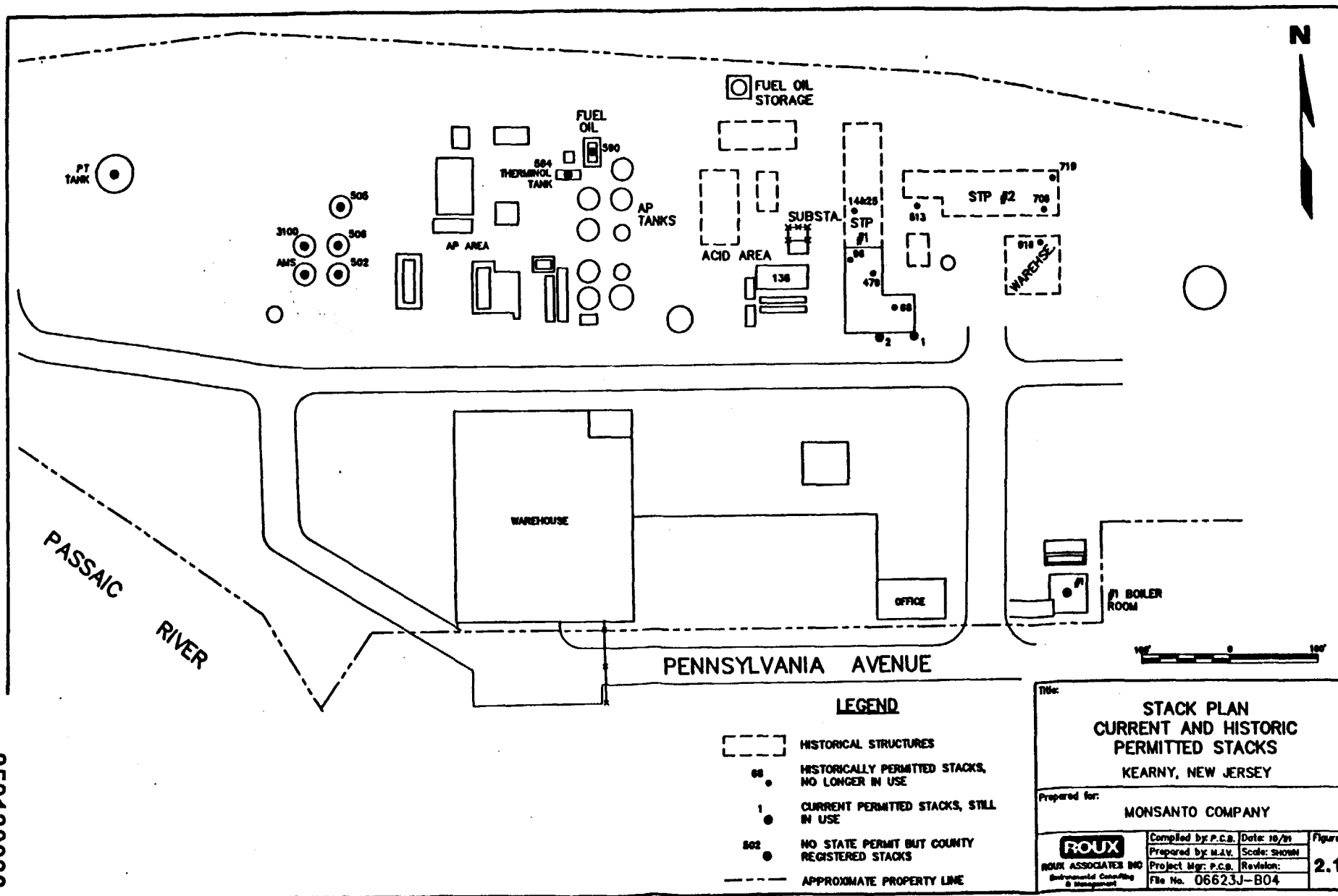
D = Dismantled Stack

I = Idle Stack

C = Canceled Permit

U = Stack in Use

850130030



ATTACHMENT 2-C

Copy of Generator's Annual Report (Item 2.C)

Monsanto

WORKING FUND ACCOUNT
MONSANTO COMPANY
KEARNY, NEW JERSEY

029 03637

62-20
311

DATE March 1, 1991

PAY
EXACTLY 4000000

\$400.00

PAY
TO THE
ORDER
OF

The Treasurer, State of New Jersey

Citibank (Delaware)

Hazardous waste fee for calendar yr 1990
to accompany 1990 hazardous waste report

⑈02903637⑈ ⑈031100209⑈ 38694087⑈

MONSANTO COMPANY, KEARNY, NEW JERSEY

THE ATTACHED CHECK IS IN PAYMENT OF THE FOLLOWING:

029 03637

3/1/91

\$400.00

Hazardous waste fee for 1990

CH 164

850130032

Monsanto

Monsanto Company
Pennsylvania Avenue
Kearny, New Jersey 07032
Phone: (201) 589-0350

March 1, 1991.

New Jersey Department of Environmental Protection
Bureau of Revenue
428 East State Street, CN 417
Trenton, New Jersey, 08625
Attention: Manifest Section-Annual Reports

Dear Sir:

In accordance with New Jersey Hazardous Waste Regulations (NJAC 7:26-7.4(g)1), Monsanto's Kearny Plant in Kearny, N.J., is submitting the "1990 Hazardous Waste Report", due on March 1, 1991.

Attached, find check for \$ 400.00 to cover the hazardous waste fee, payable to the "Treasurer, State of New Jersey".

Should you have any questions, please call me at (201) 578-8060.

Sincerely,



Constantino J. Barrial
Environmental Engineer

850130033

OFFICE USE ONLY	
Ann. Fee	_____
RA	_____
Date	_____
Rec'd By	_____

**NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
HAZARDOUS WASTE GENERATOR ANNUAL REPORT 1990
CERTIFICATION FORM**

ITEM 1 USEPA Identification (Generator) Number: NJD002444933

ITEM 2 Generator (Company) Name: MONSANTO COMPANY, KEARNY PLANT

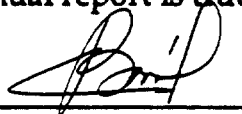
ITEM 3 Contact Person: CONSTANTINO J. BARRIAL

ITEM 4 Phone Number: (201) 578-8060

ITEM 5 Certification:

I certify that the information given in this annual report is true, accurate and complete.

CONSTANTINO J. BARRIAL
(Print or type name)


(Signature)

2/28/91
(Date)

- ITEM 6 Place an X next to the letter that applies:
- A ____ This site (company) manifested less than 1.33 tons of hazardous waste for the calendar year 1990 (No Fee)
- B ____ This site (company) manifested 1.33 tons or more of hazardous waste but less than 10 tons of hazardous waste during the calendar year 1990 (Fee \$200)
- C ____ This site (company) manifested 10 tons or more of hazardous waste but less than 100 tons of hazardous waste during the calendar year (Fee \$300)
- D X This site (company) manifested 100 tons or more of hazardous waste during the calendar year (Fee \$400)

ITEM 7 Federal Vendor Identification Number (Tax Identification Number)

PLEASE SUBMIT CHECK WITH YOUR COMPLETED REPORT.

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL OR ENTER:

SITE NAME

MOUSANTO, KEARNY PLANT

PENNSYLVANIA AVE

KEARNY, N.J., 07032

EPA ID NO.

NJID01012414191313



U.S. ENVIRONMENTAL PROTECTION AGENCY

1990 Hazardous Waste Report

FORM

IC

IDENTIFICATION AND CERTIFICATION

INSTRUCTIONS: Read the detailed instructions beginning on page 7 of the 1990 Hazardous Waste Report booklet before completing this form.

SEC. I

Site name and location address. Complete items A through H. Check the box ☒ in items A, B, D, E, F, G, and H if same as label; if different, enter corrections. If label is absent, enter information. Instruction page 7.

A. EPA ID No.

Same as label ☒ or

B. Site/company name

Same as label ☒ or

C. Has the site name associated with this EPA ID changed since 1987?

☐ 1 Yes

☒ 2 No

D. Street name and number. If not applicable, enter industrial park, building name or other physical location description.

Same as label ☒ or

E. City, town, village, etc.

Same as label ☒ or

F. County

HUDSON

G. State

Same as label ☒

H. Zip Code

Same as label ☒

SEC. II

Mailing address of site. Instruction page 7.

A. Is the mailing address the same as the location address?

☒ 1 Yes (STOP TO SEC. III)

☐ 2 No (COMPLETE SEC. II)

B. Number and street name of mailing address

C. City, town, village, etc.

D. State

E. Zip Code

SEC. III

Name, title, and telephone number of the person who should be contacted if questions arise regarding this report. Instruction page 7.

A. Please print: Last name

First name

M.I.

B. Title

C. Telephone

BARRIAL

CONSTANTINO

J.

ENVIRONMENTAL
ENGINEER

(201) 589-0350
Extension 8060

SEC. IV

Enter the Standard Industrial Classification (SIC) Code that describes the principal products, group of products, produced or distributed, or the services rendered at the site's physical location. Enter more than one SIC Code only if no one industry description includes the combined activities of the site. Instruction page 8.

A.

2869

B.

2865

C.

N/A

D.

N/A

SEC. V

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. Number of form pages submitted

Form IC

Form GM

008

Form WH

N/A

Form PB

N/A

B. Please print: Last name

First name

M.I.

C. Title

BARRIAL

CONSTANTINO

J.

D. Signature

Constantino J. Barrial

E. Date of signature

02 28 91
MO. DAY YR.

Page 1 of 13

OVER ->

850130035

Sec. VI	Generator Status
A. 1990 generation (CHECK ONE BOX BELOW) Instruction page 8	B. Reason for not generating (CHECK ALL THAT APPLY) Page 10 N/A
<input type="checkbox"/> 1 No (CONTINUE TO BOX B) <input checked="" type="checkbox"/> 2 LOG (SKIP TO SEC. VII) <input type="checkbox"/> 3 SOG	<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> 1 Never generated <input type="checkbox"/> 2 Out of business <input type="checkbox"/> 3 Only excluded or delisted waste </div> <div> <input type="checkbox"/> 4 Only non-hazardous waste <input type="checkbox"/> 5 Periodic or occasional generator <input type="checkbox"/> 6 Waste minimization activity <input type="checkbox"/> 7 Other (SPECIFY IN COMMENTS) </div> </div>

Sec. VII	On-Site Waste Management Status
A. Storage Instruction page 11 <div style="border: 1px solid black; padding: 5px; width: fit-content;">"1-NO RCRA PERMITTED STORAGE"</div>	<div style="display: flex;"> <div style="width: 30%;"> B. RCRA treatment, recycling, or disposal Page 11 <div style="border: 1px solid black; padding: 5px; width: fit-content;">1</div> </div> <div style="width: 30%;"> C. Exempt treatment, recycling, or disposal Page 12 <div style="border: 1px solid black; padding: 5px; width: fit-content;">1</div> </div> </div>

Sec. VIII	Waste Minimization Activity during 1989 or 1990
A. Did this site begin or expand a <u>source reduction</u> activity during 1989 or 1990? Instruction page 12 <input checked="" type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No	<div style="display: flex;"> <div style="width: 30%;"> B. Did this site begin or expand a <u>recycling</u> activity during 1989 or 1990? Page 13 <input type="checkbox"/> 1 Yes <input checked="" type="checkbox"/> 2 No </div> <div style="width: 30%;"> C. Did this site conduct a <u>source reduction or recycling opportunity assessment</u> during 1989 or 1990? Page 13 <input checked="" type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No </div> </div>
D. What factors have limited this site from initiating new <u>source reduction</u> activities during 1989 or 1990? (CHECK ALL THAT APPLY) Page 13	
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> 01 No factors have limited new source reduction activities. <input type="checkbox"/> 02 Insufficient capital to install new source reduction equipment or implement new source reduction practices. <input checked="" type="checkbox"/> 03 Lack of technical information on source reduction techniques applicable to the specific production processes. <input type="checkbox"/> 04 Source reduction is not economically feasible: cost savings in waste management or production will not recover the capital investment. <input checked="" type="checkbox"/> 05 Concern that product quality may decline as a result of source reduction. <input checked="" type="checkbox"/> 06 Technical limitations of the production processes. <input type="checkbox"/> 07 Permitting burdens. <input type="checkbox"/> 08 Other (SPECIFY IN COMMENTS) </div> <div style="width: 50%;"></div> </div>	

E. What factors have limited this site from initiating new on-site or off-site <u>recycling</u> activities during 1989 or 1990? (CHECK ALL THAT APPLY) Page 13	
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> 01 No factors have limited new recycling activities. <input type="checkbox"/> 02 Insufficient capital to install new recycling equipment or implement new recycling practices. <input checked="" type="checkbox"/> 03 Lack of technical information on recycling techniques applicable to this site's specific production processes. <input type="checkbox"/> 04 Recycling not economically feasible: cost savings in waste management or production will not recover the capital investment. <input checked="" type="checkbox"/> 05 Concern that product quality may decline as a result of recycling. <input type="checkbox"/> 06 Requirements to manifest wastes inhibit shipments off site for recycling. </div> <div style="width: 50%;"> <input type="checkbox"/> 07 Financial liability provisions inhibit shipments off site for recycling. <input checked="" type="checkbox"/> 08 Technical limitations of product processes inhibit shipments off site for recycling. <input checked="" type="checkbox"/> 09 Technical limitations of production processes inhibit on-site recycling. <input type="checkbox"/> 10 Permitting burdens inhibit recycling. <input type="checkbox"/> 11 Lack of permitted off-site recycling facilities. <input checked="" type="checkbox"/> 12 Unable to identify a market for recyclable materials. <input type="checkbox"/> 13 Other (SPECIFY IN COMMENTS) </div> </div>	

Comments:

850130037

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME MONSANTO, KEARNY PLANT

PENNSYLVANIA AVE

KEARNY, N.J. 07032

EPA ID NO.

NIJID002444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

Sec. I	A. Waste description Instruction Page 15 <u>MIXTURE OF OIL, SPEEDY DRY, STONES, DEBRIS COLLECTED FROM OIL SPILLED; COMBUSTIBLE; OIL</u>			
B. EPA hazardous waste code Page 15 <u>111NIA 111NIA 111NIA 111NIA</u>		C. State hazardous waste code Page 16 <u>111X17216 11111NIA</u>		
D. SIC code Page 16 <u>2869</u>	E. Source code Page 16 <u>A53</u>	F. Form code Page 16 <u>B301</u>	G. Origin Page 16 Code <u>1</u> System type <u>MI 111NIA</u>	
H. TPI constituent Page 17 <u>2</u>	I. CAS numbers Page 17 1. <u> </u> - <u> </u> - <u> </u> 2. <u> </u> - <u> </u> - <u> </u> 3. <u> </u> - <u> </u> - <u> </u> 4. <u> </u> - <u> </u> - <u> </u> 5. <u> </u> - <u> </u> - <u> </u>			

Sec. II	A. Quantity generated in 1989 Instruction Page 17 <u> </u> <u>111NIA</u>	B. Quantity generated in 1990 Page 17 <u> </u> <u>11055</u>	C. UOM Page 18 <u>1</u>	D. Density Page 18 <u> </u> <u>111NIA</u> <input type="checkbox"/> 1 lb/gal <input type="checkbox"/> 2 sg	E. Was this waste treated, disposed or recycled on site or discharged to a sewer/POTW? Page 18 <input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1) <input checked="" type="checkbox"/> 2 No (SKIP TO SEC. III)
SYSTEM 1 System type Page 18 <u>MI</u> Quantity treated, disposed or recycled in 1990 Page 18 <u> </u>			SYSTEM 2 System type Page 18 <u>MI</u> Quantity treated, disposed or recycled in 1990 Page 18 <u> </u>		

Sec. III	A. Was this waste shipped off site? Instruction Page 19 <input checked="" type="checkbox"/> 1 Yes (CONTINUE TO BOX B) <input type="checkbox"/> 2 No (SKIP TO SEC. IV)		
Site 1	B. EPA ID No. of facility to which waste was shipped Instruction Page 19 <u>NIJID0053288239</u>	C. System type Page 19 <u>MI043</u>	D. Total quantity shipped in 1990 Page 19 <u> </u> <u>11055</u>
Site 2	<u> </u>	<u>MI</u>	<u> </u>

Sec. IV	A. Waste minimization results in 1990 Instruction Page 20 <input type="checkbox"/> 1 Yes (CONTINUE TO BOX B) <input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE)				
B. Activity Page 21 <u>WI</u> <u>WI</u> <u>WI</u> <u>WI</u>	C. Other effects Page 21 <input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No	D. Quantity recycled in 1990 due to new activities Page 21 <u> </u>	E. Activity/Production Index Page 21 <u> </u>	F. Source Reduction Quantity Page 22 <u> </u>	

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

MONSANTO, KEARNY PLANT

PENNSYLVANIA AVE

KEARNY, N.J. 07032

EPA ID NO.

NJ0101012444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

Sec. I	A. Waste description Instruction Page 15 SPENT CATALYST FROM ALKYL PHENOL PROCESS; POISON B SOLID; OLEFIN AND PHENOL				
B. EPA hazardous waste code Page 15 D10102 11N1A 11N1A 11N1A			C. State hazardous waste code Page 16 11G3717 1111N1A		
D. SIC code Page 16 2869		E. Source code Page 16 A36		F. Form code Page 16 B409	
G. Origin Page 16 Code 11 System type 1111N1A					
H. TRI constituent Page 17 3		I. CAS numbers Page 17 1. 1108-95-12 2. 11N1A-11-1 3. 11-11-11 4. 11-11-11 5. 11-11-11			

Sec. II	A. Quantity generated in 1990 Instruction Page 17 114200	B. Quantity generated in 1990 Page 17 16120	C. UOM Page 18 1	D. Density Page 18 11N1A <input type="checkbox"/> 1 lbs/gal <input type="checkbox"/> 2 sg	E. Was this waste treated, disposed or recycled on site or discharged to a sewer/POTW? Page 18 <input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1) <input checked="" type="checkbox"/> 2 No (SKIP TO SEC. III)
SYSTEM 1 System type Page 18 11		Quantity treated, disposed or recycled in 1990 Page 18 11111111			
SYSTEM 2 System type Page 18 11		Quantity treated, disposed or recycled in 1990 Page 18 11111111			

Sec. III	A. Was this waste shipped off site? Instruction Page 18 <input checked="" type="checkbox"/> 1 Yes (CONTINUE TO BOX B) <input type="checkbox"/> 2 No (SKIP TO SEC. IV)		
Site 1	B. EPA ID No. of facility to which waste was shipped Instruction Page 18 NJ01010153288239	C. System type Page 18 11043	D. Total quantity shipped in 1990 Page 18 116120
Site 2		11	

Sec. IV	A. Waste minimization results in 1990 Instruction Page 20 <input type="checkbox"/> 1 Yes (CONTINUE TO BOX B) <input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE)				
B. Activity Page 21 11 11 11 11	C. Other effects Page 21 <input type="checkbox"/> 1 Yes <input type="checkbox"/> 2 No	D. Quantity recycled in 1990 due to new activities Page 21 11111111	E. Activity/Production Index Page 21 11	F. Source Reduction Quantity Page 22 11111111	

Comments: SEC I F. FORM CODE: ION EXCHANGE RESIN CATALYST WITH OLEFIN
AND PHENOL

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

MONSANTO, KEARNEY PLANT

PENNSYLVANIA AVE

KEARNEY, N.J. 07032

EPA ID NO.

NJ10002444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

Sec.
I

A. Waste description
Instruction Page 15

SPEND DISTILLATION ENDS FROM CRUDE REFINING OF ALKYLPHENOL;
FLAMMABLE LIQUID; OLEFIN AND PHENOL

B. EPA hazardous waste code
Page 15

D1001 NIA NIA NIA

C. State hazardous waste code
Page 16

C377 NIA

D. SIC code
Page 16

2869

E. Source code
Page 16

A33

F. Form code
Page 16

B219

G. Origin
Page 16

Code 1

System type

M NIA

H. TRI constituent
Page 17

3

I. CAS numbers
Page 17

1. 108-95-2 2. - - - - -

3. - - - - - 4. - - - - - 5. - - - - -

Sec.
II

A. Quantity generated in 1990
Instruction Page 17

372620

B. Quantity generated in 1990
Page 17

313020

C. UOM
Page 18

1

D. Density
Page 18

NIA

☐ 1 lbs/gal ☐ 2 kg

E. Was this waste treated, disposed or recycled on site
or discharged to a sewer/POTW?
Page 18

☐ 1 Yes (CONTINUE TO SYSTEM 1)
☒ 2 No (SKIP TO SEC. III)

SYSTEM 1

System type
Page 18

M

Quantity treated, disposed or recycled in 1990
Page 18

- - - - -

SYSTEM 2

System type
Page 18

M

Quantity treated, disposed or recycled in 1990
Page 18

- - - - -

Sec.
III

A. Was this waste shipped off site?
Instruction Page 19

☒ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (SKIP TO SEC. IV)

Site
1

B. EPA ID No. of facility to which waste was shipped
Instruction Page 19

NJ10053288239

C. System type
Page 19

M041

D. Total quantity shipped in 1990
Page 19

313020

Site
2

- - - - -

M

- - - - -

Sec.
IV

A. Waste minimization results in 1990
Instruction Page 20

☒ 1 Yes (CONTINUE TO BOX B)
☐ 2 No (THIS FORM IS COMPLETE)

B. Activity
Page 21

W54 W12

W W

C. Other effects
Page 21

☐ 1 Yes

☒ 2 No

D. Quantity recycled in 1990 due to new activities
Page 21

- - - - - NIA

E. Activity/Production Index
Page 21

1.0

F. Source Reduction Quantity
Page 22

59600

Comments: SEC. I F. FORM CODE: MIXTURE OF PHENOL, OLEFINS AND ALKYLPHENOL
SEC. IV E. ACTIVITY/PRODUCTION INDEX (SEE ATTACHMENT)

Page 6 of 13

850130040

ACTIVITY / PRODUCTION INDEX

PRODUCTION OF:

NONYLPHENOL AND DODECYL PHENOL

1989

24,819,742 LBS.

1990

25,450,618 LBS.

ACTIVITY / PRODUCTION INDEX

$$\frac{(1990 \text{ PRODUCTION})}{(1989 \text{ PRODUCTION})} = \frac{25,450,618}{24,819,742} = 1.025$$

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

MONSANTO, KEARNY PLANT

PENNSYLVANIA AVE

WEST KEARNY, N.J. 07032

EPA ID NO.

NJID0024449313



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

| | | | | | |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------|------------------------------------------------------|--|
| Sec. I | A. Waste description
Instruction Page 15
SPILLED MALEIC ANHYDRIDE ON MALEIC ANHYDRIDE TERMINAL
CONCRETE PAD; ORH-A SOLID; MALEIC ANHYDRIDE. | | | | |
| B. EPA hazardous waste code
Page 15
U147 NIA NIA NIA | | | C. State hazardous waste code
Page 16
NIA | | |
| D. SIC code
Page 16
2869 | E. Source code
Page 16
153 | | F. Form code
Page 16
1319 | G. Origin
Page 16
Code L
System type MI NIA | |
| H. TRI constituent
Page 17
2 | I. CAS numbers
Page 17
1. 2. 3. 4. 5. | | | | |

| | | | | | |
|------------------------------------------|-------------------------------------------------------------|-------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sec. II | A. Quantity generated in 1990
Instruction Page 17
NIA | B. Quantity generated in 1990
Page 17
383 | C. UOM
Page 18
1 | D. Density
Page 18
NIA
<input type="checkbox"/> 1 lbs/gal <input type="checkbox"/> 2 kg | E. Was this waste treated, disposed or recycled on site
or discharged to a sewer/POTW?
Page 18
<input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1)
<input checked="" type="checkbox"/> 2 No (SKIP TO SEC. III) |
| SYSTEM 1
System type
Page 18
MI | | | SYSTEM 2
System type
Page 18
MI | | |

| | | | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------|--|
| Sec. III | A. Was this waste shipped off site?
Instruction Page 19
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (SKIP TO SEC. IV) | | | |
| Site 1 | B. EPA ID No. of facility to which waste was shipped
Instruction Page 19
NJID008921167910 | C. System type
Page 19
MI043 | D. Total quantity shipped in 1990
Page 19
383 | |
| Site 2 | | | | |

| | | | | | |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------|-----------------------------------------|--|
| Sec. IV | A. Waste minimization results in 1990
Instruction Page 20
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE) | | | | |
| B. Activity
Page 21
WI WI | C. Other effects
Page 21
<input type="checkbox"/> 1 Yes
<input checked="" type="checkbox"/> 2 No | D. Quantity recycled in 1990 due to new activities
Page 21 | E. Activity/Production Index
Page 21 | F. Source Reduction Quantity
Page 22 | |

Comments: SEC I F. FORM CODE: SPILLED MALEIC ANHYDRIDE
G. ORIGIN: SPILLED MALEIC ANHYDRIDE

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

HOUSANTO, KEARNY PLANT

EPA ID NO.

PENNSYLVANIA AVE
KEARNY, N.J. 07032
NJID01012444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

| | | | | |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|--|
| Sec. I | A. Waste description
Instruction Page 15
SPENT TOLUENE AND WATER MIXTURE FROM CATALYST ACTIVATION
IN ALKYL PHENOL PROCESS; FLAMMABLE LIQUID; TOLUENE, PHENOL | | | |
| B. EPA hazardous waste code
Page 15
D1011 F1015 11N1A 11N1A | | C. State hazardous waste code
Page 15
1111N1A 1111N1A | | |
| D. SIC code
Page 16
2869 | E. Source code
Page 16
A49 | F. Form code
Page 16
B219 | G. Origin
Page 18
Code 11
System type 11N1A | |
| H. TFI constituent
Page 17
1 | I. CAS numbers
Page 17
1. 11111-111-1 2. 11111-111-1
3. 11111-111-1 4. 11111-111-1 5. 11111-111-1 | | | |

| | | | | | |
|-------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sec. II | A. Quantity generated in 1990
Instruction Page 17
11111111N1A | B. Quantity generated in 1990
Page 17
1111114620 | C. UOM
Page 18
11 | D. Density
Page 18
1111N1A
<input type="checkbox"/> 1 lbs/gal <input type="checkbox"/> 2 kg | E. Was this waste treated, disposed or recycled on site
or discharged to a sewer/POTW?
Page 18
<input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1)
<input checked="" type="checkbox"/> 2 No (STOP TO SEC. III) |
| SYSTEM 1
System type
Page 18
111111 | | Quantity treated, disposed or recycled in 1990
Page 18
1111111111 | | SYSTEM 2
System type
Page 18
111111 | |
| Quantity treated, disposed or recycled in 1990
Page 18
1111111111 | | Quantity treated, disposed or recycled in 1990
Page 18
1111111111 | | | |

| | | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------|
| Sec. III | A. Was this waste shipped off site?
Instruction Page 18
<input checked="" type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input type="checkbox"/> 2 No (STOP TO SEC. IV) | | |
| Site 1 | B. EPA ID No. of facility to which waste was shipped
Instruction Page 18
NJID1015131218181319 | C. System type
Page 18
1110411 | D. Total quantity shipped in 1990
Page 18
1111114620 |
| Site 2 | 111111111111N1A | 1111N1A | 1111111111N1A |

| | | | | | |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------|--|
| Sec. IV | A. Waste minimization results in 1990
Instruction Page 20
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE) | | | | |
| B. Activity
Page 21
111111 111111
111111 111111 | C. Other effects
Page 21
<input type="checkbox"/> 1 Yes
<input type="checkbox"/> 2 No | D. Quantity recycled in 1990 due to new activities
Page 21
1111111111 | E. Activity/Production Index
Page 21
111111 | F. Source Production Quantity
Page 22
1111111111 | |

Comments: SEC I E. SOURCE CODE: CATALYST IS ACTIVATED BY REMOVING WATER FROM IT.
SEC I F. FORM CODE: MIXTURE OF TOLUENE, PHENOL AND WATER.

Page 9 of 13

850130043

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

HOUSANO, KEARNY PLANT

PENNSYLVANIA AVE

KEARNY, N.J. 07032

EPA ID NO.

NJID002444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

| | | | | | |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------|-----------------------------------|--|
| Sec. I | A. Waste description
Instruction Page 15
LAB PAK (INK PRIMER, WATER PROOF COMPOUND, ROOF CEMENT, DUPLICATING FLUID, INK CONTAINING METHYL ISO BUTYL KETONE, TAR SEALANT, METALIC SHIELD PAINT; FLAMMABLE LIQUID, PETROLEUM DISTILLATES, METHANOL. | | | | |
| B. EPA hazardous waste code
Page 15
D1001 U154 U161 INIA | | | C. State hazardous waste code
Page 16
INIA | | |
| D. SIC code
Page 18
2869 | | E. Source code
Page 18
189 | | F. Form code
Page 18
181019 | |
| G. Origin
Page 18
Code 1
System type MI-WA | | | | | |
| H. TPI constituent
Page 17
2 | | I. CAS numbers
Page 17
1. 2. 3. 4. 5. | | | |

| | | | | | | |
|------------------------------------------|--------------------------------------------------------------|--|-----------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sec. II | A. Quantity generated in 1990
Instruction Page 17
INIA | | B. Quantity generated in 1990
Page 17
1120 | C. UOM
Page 18
1 | D. Density
Page 18
INIA
<input type="checkbox"/> 1 lbs/gal <input type="checkbox"/> 2 kg | E. Was this waste treated, disposed or recycled on site or discharged to a sewer/POTW?
Page 18
<input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1)
<input checked="" type="checkbox"/> 2 No (SKIP TO SEC. III) |
| SYSTEM 1
System type
Page 18
MI | | | Quantity treated, disposed or recycled in 1990
Page 18 | | | |
| SYSTEM 2
System type
Page 18
MI | | | Quantity treated, disposed or recycled in 1990
Page 18 | | | |

| | | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------|
| Sec. III | A. Was this waste shipped off site?
Instruction Page 19
<input checked="" type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input type="checkbox"/> 2 No (SKIP TO SEC. IV) | | |
| Site 1 | B. EPA ID No. of facility to which waste was shipped
Instruction Page 19
LIAID01103951127 | C. System type
Page 19
MI041 | D. Total quantity shipped in 1990
Page 19
1120 |
| Site 2 | | MI | |

| | | | | | |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| Sec. IV | A. Waste minimization results in 1990
Instruction Page 20
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE) | | | | |
| B. Activity
Page 21
WI WI | | C. Other effects
Page 21
<input type="checkbox"/> 1 Yes
<input type="checkbox"/> 2 No | D. Quantity recycled in 1990 due to new activities
Page 21 | E. Activity/Production Index
Page 21 | F. Source Reduction Quantity
Page 22 |

Comments: SEC I E. FORM CODE : MAINTENANCE CLEAN UP.-
SEC I F. PRODUCTS USED FOR PLANT MAINTENANCE.-

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME

MOUSANTO, KEARNY PLANT

PENNSYLVANIA AVE

KEARNY, N.J. 07032

EPA ID NO.

NJ1010124449131



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

FORM
GM

WASTE GENERATION AND
MANAGEMENT

INSTRUCTIONS: Read the detailed instructions beginning on page 14 of the 1990 Hazardous Waste Report booklet before completing this form.

| | | | | |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------|--|
| Sec. I | A. Waste description
Instruction Page 15
LAB PACK - LAB REAGENTS AND RETAIN SAMPLES; FLAMMABLE LIQUID, ORM-A SOLIDS, CORROSIVE LIQUIDS, POISON B SOLIDS, FLAMMABLE SOLID, OXIDIZER; HALIC ANHYDRIDE, KARL FISHER REAGENTS, PYRIDINE, THYMOL BLUE, TERPENTINE, ALKYL METHYL STYRENE, | | | |
| B. EPA hazardous waste code
Page 15
U1147 D1R1M1 D1001 U1196 | | C. State hazardous waste code
Page 15
NIA NIA | | |
| D. SIC code
Page 16
2869 | E. Source code
Page 16
A59 | F. Form code
Page 16
B1001 | G. Origin
Page 16
Code 1
System type IM NIA | |
| H. TRI constituent
Page 17
2 | I. CAS numbers
Page 17
1. 2. 3. 4. 5. | | | |

| | | | | | |
|------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sec. II | A. Quantity generated in 1990
Instruction Page 17
NIA | B. Quantity generated in 1990
Page 17
666 | C. UOM
Page 18
1 | D. Density
Page 18
NIA
<input type="checkbox"/> 1 lbs/gal <input type="checkbox"/> 2 sg | E. Was this waste treated, disposed or recycled on site or discharged to a sewer/POTW?
Page 18
<input type="checkbox"/> 1 Yes (CONTINUE TO SYSTEM 1)
<input checked="" type="checkbox"/> 2 No (SKIP TO SEC. III) |
| SYSTEM 1
System type
Page 18
IM | | Quantity treated, disposed or recycled in 1990
Page 18 | | | |
| SYSTEM 2
System type
Page 18
IM | | Quantity treated, disposed or recycled in 1990
Page 18 | | | |

| | | | |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------|
| Sec. III | A. Was this waste shipped off site?
Instruction Page 19
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (SKIP TO SEC. IV) | | |
| Site 1 | B. EPA ID No. of facility to which waste was shipped
Instruction Page 19
LA101011039151127 | C. System type
Page 19
M1041 | D. Total quantity shipped in 1990
Page 19
666 |
| Site 2 | | | |

| | | | | | |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------|-----------------------------------------|--|
| Sec. IV | A. Waste minimization results in 1990
Instruction Page 20
<input type="checkbox"/> 1 Yes (CONTINUE TO BOX B)
<input checked="" type="checkbox"/> 2 No (THIS FORM IS COMPLETE) | | | | |
| B. Activity
Page 21
W1 W1
W1 W1 | C. Other effects
Page 21
<input type="checkbox"/> 1 Yes
<input checked="" type="checkbox"/> 2 No | D. Quantity recycled in 1990 due to new activities
Page 21 | E. Activity/Production Index
Page 21 | F. Source Reduction Quantity
Page 22 | |

Comments: SEC I A. WASTE DESCRIPTION: SODIUM AND POTASSIUM HYDROXIDE, ACETIC ANHYDRIDE, PHOSPHOROUS REAGENT, LITHIUM SOLUTION CONTAINING HYDROCHLORIC ACID, POTASSIUM CYANIDE, ARSENIC TRIOXIDE, ETHYL ETHER, SILVER NITRATE, SILVER DIETHYL CARBAMATE, COPPER POWDER, DIMETHYL AMINE BORANE.

SEC I B. EPA HAZARDOUS WASTE CODE: U154, D002, P098, P012, D004, U117, U002, D011, F005 Page 11 of 13

850130045

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME MONSANTO, KEARNY PLANT
PENNSYLVANIA AVE
KEARNY, N.J., 07032.

EPA ID NO. NJID 002444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

OFF-SITE IDENTIFICATION

FORM

OI

INSTRUCTIONS: Read the detailed instructions on the back of this page before completing this form.

| | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site 1 | A. EPA ID No. of off-site installation or transporter
<u>NJID 05328182319</u> | B. Name of off-site installation or transporter
<u>ROLLINS ENVIRONMENTAL SERVICES (N.J.) INC.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>ROUTE 322 & I-295</u>
City <u>BRIDGEPORT</u> State <u>NJ</u> Zip Code <u>08014</u> - <u> </u> |
| Site 2 | A. EPA ID No. of off-site installation or transporter
<u>NJID 0711629976</u> | B. Name of off-site installation or transporter
<u>S-J TRANSPORTATION CO.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>NA</u>
City <u> </u> State <u> </u> Zip Code <u> </u> - <u> </u> |
| Site 3 | A. EPA ID No. of off-site installation or transporter
<u>ALID 000622464</u> | B. Name of off-site installation or transporter
<u>CHEMICAL WASTE MANAGEMENT, INC.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>ALABAMA HIGHWAY 17 AT MILE MARKER 163</u>
City <u>EMELLE</u> State <u>AL</u> Zip Code <u>35459</u> - <u> </u> |
| Site 4 | A. EPA ID No. of off-site installation or transporter
<u>NJID 046555033</u> | B. Name of off-site installation or transporter
<u>LACY'S EXPRESS INC.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>NA</u>
City <u> </u> State <u> </u> Zip Code <u> </u> - <u> </u> |
| Site 5 | A. EPA ID No. of off-site installation or transporter
<u> </u> | B. Name of off-site installation or transporter
<u> </u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u> </u>
City <u> </u> State <u> </u> Zip Code <u> </u> - <u> </u> |

Comments:

BEFORE COPYING FORM, ATTACH SITE IDENTIFICATION LABEL
OR ENTER:

SITE NAME MON SANTO, KEARNY PLANT
PENNSYLVANIA AVE
KEARNY, N.J., 07032

EPA ID NO. NJID0002444933



U.S. ENVIRONMENTAL
PROTECTION AGENCY

1990 Hazardous Waste Report

OFF-SITE IDENTIFICATION

FORM

01

INSTRUCTIONS: Read the detailed instructions on the back of this page before completing this form.

| | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Site 1 | A. EPA ID No. of off-site installation or transporter
<u>ILID0099202681</u> | B. Name of off-site installation or transporter
<u>CHEMICAL WASTE MANAGEMENT</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>NA</u>
City _____ State <u>IL</u> Zip Code _____ |
| Site 2 | A. EPA ID No. of off-site installation or transporter
<u>NJID0089216790</u> | B. Name of off-site installation or transporter
<u>CHEMICAL WASTE MANAGEMENT OF N.J., INCORPORATED</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input type="checkbox"/> Transporter
<input checked="" type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>100 LISTER AVE</u>
City <u>NEWARK</u> State <u>NJ</u> Zip Code <u>07105</u> |
| Site 3 | A. EPA ID No. of off-site installation or transporter
<u>LAID001103951127</u> | B. Name of off-site installation or transporter
<u>ROLLINS ENVIRONMENTAL SERVICES (LA) INC.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input type="checkbox"/> Transporter
<input checked="" type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>13351 SCENEK HIGHWAY</u>
City <u>BATON ROUGE</u> State <u>LA</u> Zip Code <u>70807</u> |
| Site 4 | A. EPA ID No. of off-site installation or transporter
<u>PIAD000878140712</u> | B. Name of off-site installation or transporter
<u>JOHN PFROMMER INC.</u> |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input checked="" type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street <u>NA</u>
City _____ State _____ Zip Code _____ |
| Site 5 | A. EPA ID No. of off-site installation or transporter
_____ | B. Name of off-site installation or transporter
_____ |
| C. Handler type (CHECK ALL THAT APPLY)
<input type="checkbox"/> Generator
<input type="checkbox"/> Transporter
<input type="checkbox"/> TSDR | | D. Address of off-site installation
Street _____
City _____ State _____ Zip Code _____ |

Comments:

ATTACHMENT 3

Summary of Enforcement Actions of Environmental Laws and Regulations (Item 3)

Summary of Enforcement Action for Violation of Environmental Laws or Regulations:

1. Date of Action: June 22, 1989
Section of Law or Statute Violated: N.J.S.A. 58:10-23.11(c)
New Jersey Spill Compensation and Control Act
Type of Enforcement Action: Administrative Consent Order
Description of Enforcement Action: Monsanto was required to pay within 30 days a \$250,000 penalty, to initiate a remedial investigation and clean-up and pay state fees for oversight.
How the Violation was Resolved: Monsanto submitted to the Department The Remedial Investigation Workplan in December 1989. The investigation was subsequently initiated and a Preliminary Remedial Investigation Report was submitted to the Department in August 1991. Clean-up activities will begin at Department's directive following approval of the Remedial Investigation Report.

2. Date of Action: March 1990
Section of Law or Statute Violated: Section 3008 SWDA (EPA RCRA Regulations)
Type of Enforcement Action: Notice of Violation
Description of Enforcement Action: Fifteen days to submit, to the investigator, the corrective measures taken to attain compliance.
Description of Violation: Incorrect code was used on a waste disposal manifest. Toluene was classified using an incorrect waste code.
How the Violation was Resolved: The manifest was corrected. A fine was paid by Monsanto Company.

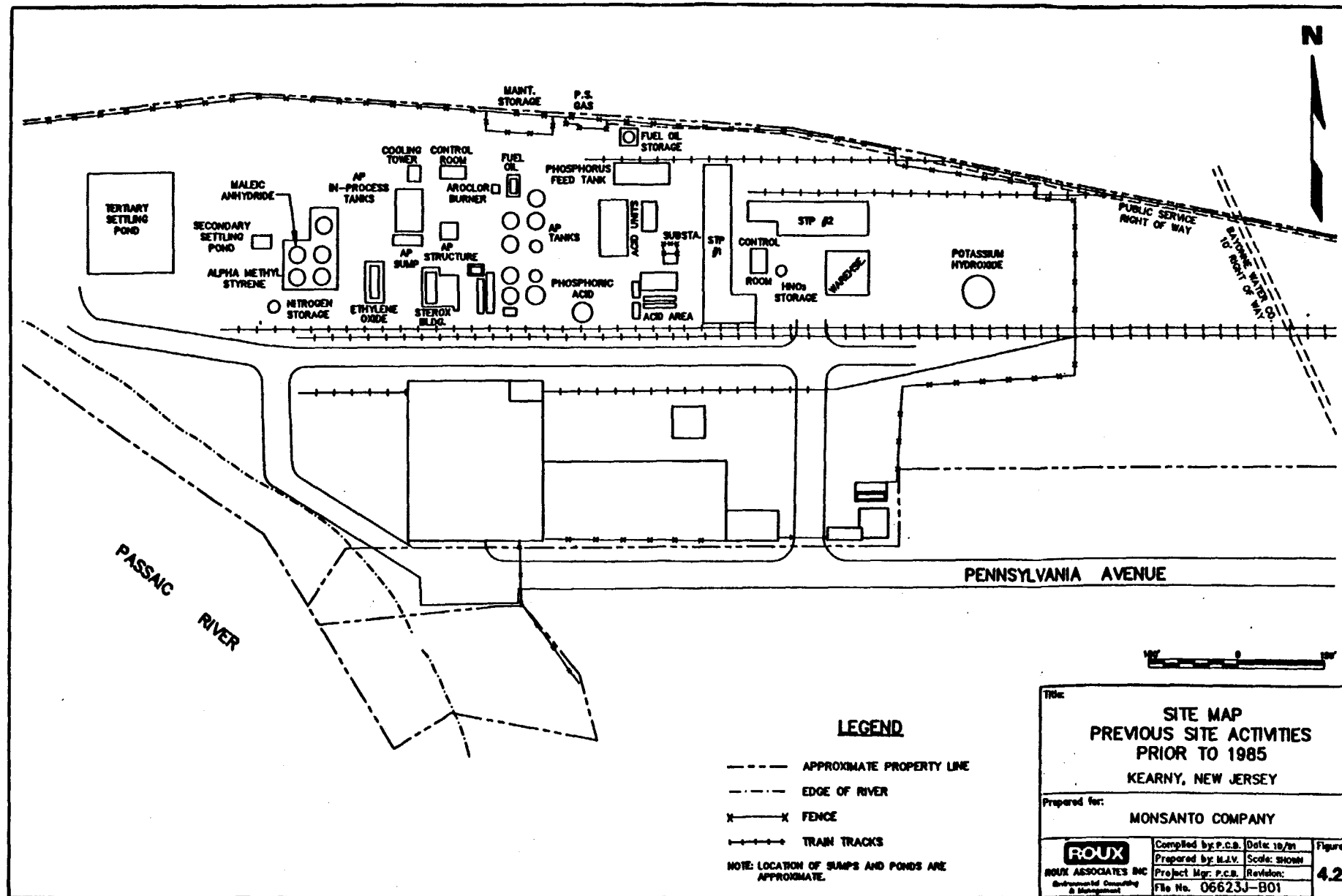
3. Date of Action: 11/21, 26, 27, 30/90
Section of Law or Statute Violated: Federal Categorical Pretreatment Regulation (40 CFR 414) and 313.1 of Passaic Valley Sewerage Commissioners (PVSC) Rules and Regulations.
Type of Enforcement Action: Notice of Violation
Description of Enforcement Action: Required to investigate non-compliance and solve problem.
Description of Violation: Permit limits were exceeded for Toluene and Methylene Chloride for Outlet #1. The PVSC were notified of the problem.
How the Violation was Resolved: Monsanto investigated the problem and determined that toluene had been used to remove moisture from the catalyst in the Alkyl Phenol Process. This practice occurred once annually. The process has been modified to use a dry catalyst, eliminating the need for toluene. Methylene chloride is not an operations material or a by-product. The source is not known.

4. Date of Action: 2/4/91
Section of Law or Statute Violated: Federal Categorical Pretreatment Regulations (40 CFR 414) and Section 313.1 of PVSC Rules and Regulations
Type of Enforcement Action: Notice of Violation
Description of Enforcement Action: Ten days to submit corrections to the flow diagram, to the inspector.
Description of Violation: Reporting Deficiency. Sample points were not identified on flow diagram. Regulated and unregulated flows were not indicated on flow diagram. Flow diagram was not signed.
How the Violation was Resolved? The diagram was corrected and resubmitted. A fine was paid.
5. Date of Action: 2/27/91
Section of Law or Statute Violated: Section 312.1(B) PVSC Rules and Regulations
Type of Enforcement Action: Notice of Violation
Description of Enforcement Action: Required to determine the source of the problem and correct it to prevent future low pH discharges.
Description of Violation: Permit limits were exceeded for pH for 2 hours when the pH was below 5 for 2-1/2 hours.
How the Violation was Resolved: Monsanto investigated the source of the discharge causing a low pH. A crack was found in dikes around a storage tank which stored diluted phosphoric acid. There was some overflow of the diluted acid. Repairs were made to the dike and sewer pipe to correct the problem.
6. Date of Action: 7/21/91
Section of Law or Statute Violated: Section 403.12(e) General Pretreatment Regulations of the PVSC Rules and Regulations and the Sewer Connection Permit.
Type of Enforcement Action: Notice of Violation
Description of Enforcement Action: Required to correct the paper work and a fine.
Description of Violation: Reporting Deficiency. Calculation sheets were not included in the report. A proper compliance statement was not provided. Maximum limits were not included in the report. Sample preservation method was incomplete.
How the Violation was Resolved: The paper work was corrected and resubmitted. A fine was paid.

ATTACHMENT 4

Current and Historic Site Maps (Item 4)

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ATTACHMENT 5

Description of Past and Current Site Operations (Item 5)

| | |
|------------------------------------------------------------------------|---|
| 5.0 DESCRIPTION OF PAST AND CURRENT SITE OPERATIONS | 1 |
| 5.1 Products Manufacturing History | 1 |
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| 5.1.2 Sodium Tripolyphosphate (STP) Process | 2 |
| 5.1.3 Alkylphenol Process | 3 |
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| 5.1.4 Steroxes® | 5 |
| 5.1.5 Other Products Manufacturing Activities | 6 |
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- 5.2 General Process Diagram - Sodium Tripolyphosphate (STP)
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- 5.4 General Process Diagram - Sterox®

5.0 DESCRIPTION OF PAST AND CURRENT SITE OPERATIONS

5.1 Products Manufacturing History

The Monsanto Kearny plant began process operations in 1955. Currently there are two on-site Monsanto Activities: alkylphenol production, warehousing, and distribution of a variety of Monsanto and other products. Additionally, a portion of the plant is leased as a trucking terminal. A chronologic summary of primary process operations was presented in Item 1 (Attachment 1-B).

The plant first manufactured phosphoric acid and sodium tripolyphosphate (STP). These process units were located in the eastern part of the plant site. Later in 1966, new production units for each process (phosphoric acid and STP) were added. The process operation ended in 1985, and the units were subsequently dismantled.

Sterox[®] manufacturing began in 1956, followed by the alkylphenol (AP) manufacturing in 1960. AP is currently manufactured on-site with the process units located in the central portion of the site. Sterox[®] production ended in 1990; the process units are adjacent to the AP units.

The following subsections provide general process descriptions for each manufacturing process. The information presented, including the raw and waste materials and disposal practices associated with each chemical process, was gathered through historical file reviews and interviews with plant personnel.

5.1.1 Phosphoric Acid Process

Phosphorous (P_4) was received by railroad tank cars and unloaded into storage tanks. From the storage tanks, phosphorous was pumped to the top of burning tower and oxidized with air to form phosphorous pentoxide (P_2O_5) gas (Figure 5.1). The hot P_2O_5 gas would pass through the bottom of the tower into a hydrator and absorber. Weak phosphoric acid (2% to 5%) was sprayed into the hydrator to cool the hot gases which then continued toward the absorber. In cooling the gases, the dilute acid was concentrated by evaporation, simultaneously supplying

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water vapor for hydration of the P_2O_5 gas formed in the burning tower. Weak acid sprayed in the absorber reacted with the P_2O_5 gas to form phosphoric acid (H_3PO_4). The acid was either pumped to storage tanks, pumped to a mix tank for food grade acid production, or pumped to the process tanks for STP production. After leaving the absorber, the remaining P_2O_5 in the gas stream was removed from the scrubber system with a weak acid spray. The P_2O_5 was then recycled through the process again.

5.1.2 Sodium Tripolyphosphate (STP) Process

In general, the STP process consisted of continuously mixing soda ash and phosphoric acid in varying proportions, drying and calcining the mixture, and grinding the dried solids to produce STP.

Soda ash was received by either railroad hopper cars or by barge and stored in silos (Figure 5.2). The soda ash was fed by conveyor into three mixers, in series, and reacted with phosphoric acid forming a mixture of sodium hydrogen phosphate (Na_2HPO_4) and sodium dihydrogen phosphate ($Na_2H_2PO_4$). Subsequently, the mixture was fed to a dryer where it was steamed with hot gases (approximately $450^\circ C$). The gases provided sufficient heat to remove all the free water as vapor from the mixture. The Na_2HPO_4/H_2PO_4 mixture was then processed through a toller mill where the dried solids were ground to specified size and sent by elevator to storage bins.

From the storage bins, the solids were heated in the calciner to approximately $850^\circ C$ to vaporize chemically combined water to form STP ($Na_5P_3O_{10}$). The heat was supplied by gases from the combustion of natural gas or fuel oil. The exhaust gases from the calciner served as inlet gases for the dryer. Gases exiting the system were passed through exhaust cyclones for dust removal.

The STP product was then cooled and fed by hopper into a mill which ground the product to the desired granular or powdered size. The material was fed through a cyclone separator and stored in silos. The product was packed in 100-pound bags and shipped out in bulk either in trucks or hopper cars.

5.1.3 Alkylphenol Process

Alkylphenols are manufactured by reacting the appropriate olefin with phenol in the presence of a catalyst. The process has three main steps: catalyst activation, alkylation, and distillation. Phenol is received at the facility in tank cars or trucks and pumped into the phenol storage tank. Since phenol crystallizes at 40°C, the storage tank is maintained at 50 to 55°C. The phenol storage tank is also maintained under nitrogen pressure because phenol is hygroscopic (will absorb water from the air). The olefins (nonene and propylene tetramer) are received in tank cars or trucks (and in the past, by barge) and pumped into storage tanks.

In the activation step, the catalyst is activated before it is used in the process (Figure 5.3). The catalyst is heated with toluene and phenol to drive out moisture. It is heated again with an olefin, either nonene or propylene tetramer, and after the catalyst is cooled, it is dropped into the reactor. Recently the activation step has been modified by using a dry catalyst to eliminate the use of toluene for moisture removal.

Fresh phenol and olefin are pumped from storage under a controlled flow to begin the alkylation process step. As the flow passes through the fixed bed reactor with the catalyst as the bed, the phenol and olefin are partially converted to alkylphenol. The effluent from the reactor, the alkylated liquor, consists of final alkylphenol product, unreacted phenol, olefin, low boiling and high boiling alkylphenol.

The alkylated liquor is preheated and then fed into the phenol distillation columns. In the phenol distillation column, the material is heated further until the low boiling fraction comes off overhead as a vapor and is condensed and recycled to the reactor tank. The higher boiling fraction, the crude alkylphenol, comes off the bottom of the column as a liquid.

The crude alkylphenol is then fed into the product column after it has been preheated to 185°C. Here, the material is heated further to separate the final product from the high boiling fraction. The final product comes off overhead as a vapor that is condensed and fed into a production day tank. The high boiling fraction is also a saleable stream and is maintained within established quality specifications. The high boiling fraction is a non-hazardous waste, shipped off-site or

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used in fuel blending. It can also be recycled to the reactor if market conditions do not warrant resale of the material.

5.1.3.1 Past and Present Heat-Transfer System: PCB and Non-PCB Liquids

Where temperatures above 100°C are necessary in the production of alkyphenols, particularly in the distillation steps, a thermal liquid heat transfer system is used. In the past, from 1960 to 1972, the heat-transfer fluid used in the system polychlorinated biphenyls (PCBs), for their fire-resistant and relatively inert characteristics. The system presently is charged with a non-chlorinated biphenyl fluid marketed under a Monsanto trade name, Therminol 66.

The thermal liquid system is a closed recirculating system. It begins when the heat transfer fluid is pumped into the heater or burner where it is heated to above 300°C. The fluid is circulated into the process system and returns to the storage tank, to be pumped back into the burner and recirculated again in order to maintain a steady temperature.

During a process upset, in 1967-68, the alkylphenol reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the fluid became gel-like according to plant personnel. A disposal pit was excavated next to the control room and 2,000 gallons of PCB thermal fluid were drained from the tank and heater through a trench dug to the disposal area, referred to as the PCB Disposal Area (PDA) (Figure 5.4). The system tank was recharged again with chlorinated biphenyl heat transfer fluid (PCB thermal fluid). When the system was converted in 1972 to Therminol 66, a non-PCB fluid, the tank containing 2,000 gallons of PCB thermal fluid was drained again in the same area next to the control room.

In 1981, a new 3,000-gallon tank was installed south of the burner and the old PCB/Therminol 66 tank was dismantled.

5.1.4 Steroxes®

Various ethoxylated alkylphenol products (Steroxes®) were manufactured by reacting an alkylphenol with ethylene oxide, in varying amounts, in the presence of potassium hydroxide as a catalyst. The three basic process steps are reaction, neutralization, and filtration.

In the reactor preparation stage, the appropriate quantities of alkylphenol and ethylene oxide were transferred from the storage tanks to separate weigh tanks (Figure 5.5). The temperature in the AP weigh tank was raised to 100°C by applying steam to the coils. A 45% potassium hydroxide (KOH) solution was added to the AP weigh tank. The mixture was heated to 160°C for 1 to 1½ hours with agitation and a nitrogen purge to remove the water, and then transferred to the reactor.

The dry alkylphenol-KOH mixture and ethylene oxide were then transferred from the weigh tanks to the nitrogen-pressurized reactor. The total time required for the ethoxylation reaction was approximately 3 hours. On completion of the reaction, the product was cooled and transferred to the neutralization tank.

After the product had been transferred to the neutralization (filter feed) tank, carbon dioxide gas and water was fed to the tank. The neutralized product was then steam heated to 125°C and filtered. Initially, before the filtration process, a small amount of precoat material (filter aid) was added to the precoat tank with a portion of the neutralized batch, and the mixture was circulated to disperse the precoat. The feed was subsequently pumped out of the filter feed tank through the filter to remove precipitated salts and back to the filter feed tank until the filtrate runs clear. Once clear, the final products were pumped to storage.

Most raw materials were supplied by either rail or trucks; Ethylene oxide was received in tank cars. The ethylene oxide unloading and handling operations were closed systems that were maintained under nitrogen pressure to prevent vaporization and fire hazards. The 45% potassium hydroxide (KOH) solution was received by tank truck and unloaded into the KOH storage tank. On-site nitrogen bulk storage facilities were owned and maintained by the nitrogen supplier. They consisted of a liquid nitrogen storage tank and a nitrogen vaporizer. Carbon

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dioxide was received by tank truck and loaded into a pressurized liquid carbon dioxide storage tank. The tank was owned and maintained by the supplier. Filter aid (cellulose base fibers) was received in 25 pound bags and added as needed to the precoat tank by hand.

5.1.5 Other Products Activities

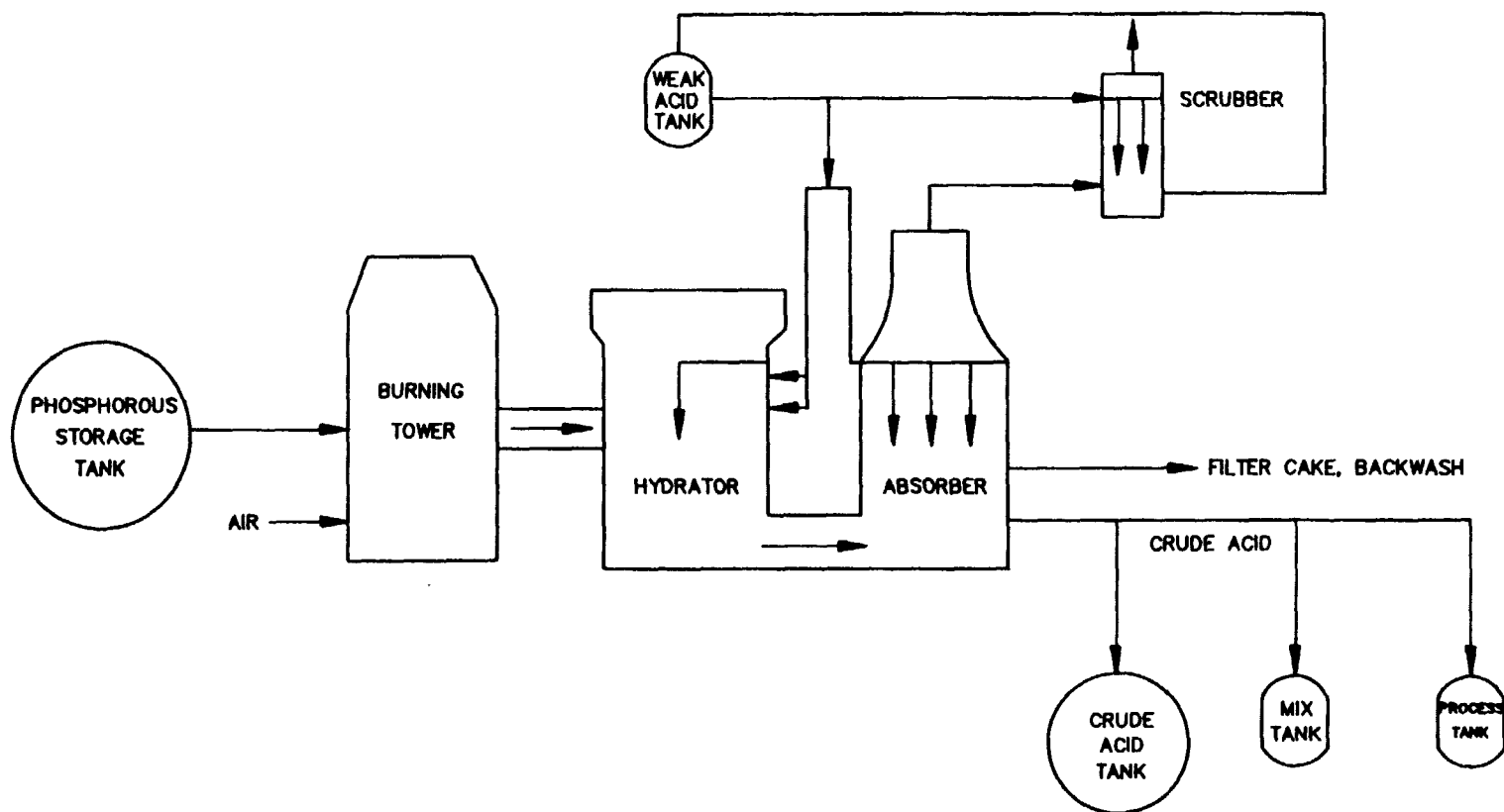
Other operations on site included extrusion of vinyl siding and paneling from 1967 to 1970. The manufacturing process used vinyl pellets, which were shipped to the plant. The vinyl pellets were placed in a hopper; the pellets entered a chambered heating system and were propelled by auger through a mold. They were dyed, stabilized and then cooled with air and/or hot water. Kearny had three extruders for manufacture of vinyl panels and three extruders for manufacture of vinyl siding.

Since 1976 a portion of the site has been used as a warehouse/distribution center. Materials stored in the warehouse are both manufacturing products from the Kearny Plant and other Monsanto operations, and some products manufactured by others. A complete list of the hazardous materials stored in the warehouse is presented in Item 9. (Appendix J). Most of the warehoused products are solids; however some, such as nonylphenol are liquids contained in drums. Most of the warehoused products are located on the first floor of the Warehouse (See Site Map, Attachment 4). Additionally, liquid malaic anhydride and phosphoric acid are stored in tanks at the southwest corner of the process area and in the acid area, respectively. Powder STP is stored in silos in the former STP process area.

5.2 Other Site Operations

5.2.1 API Activities

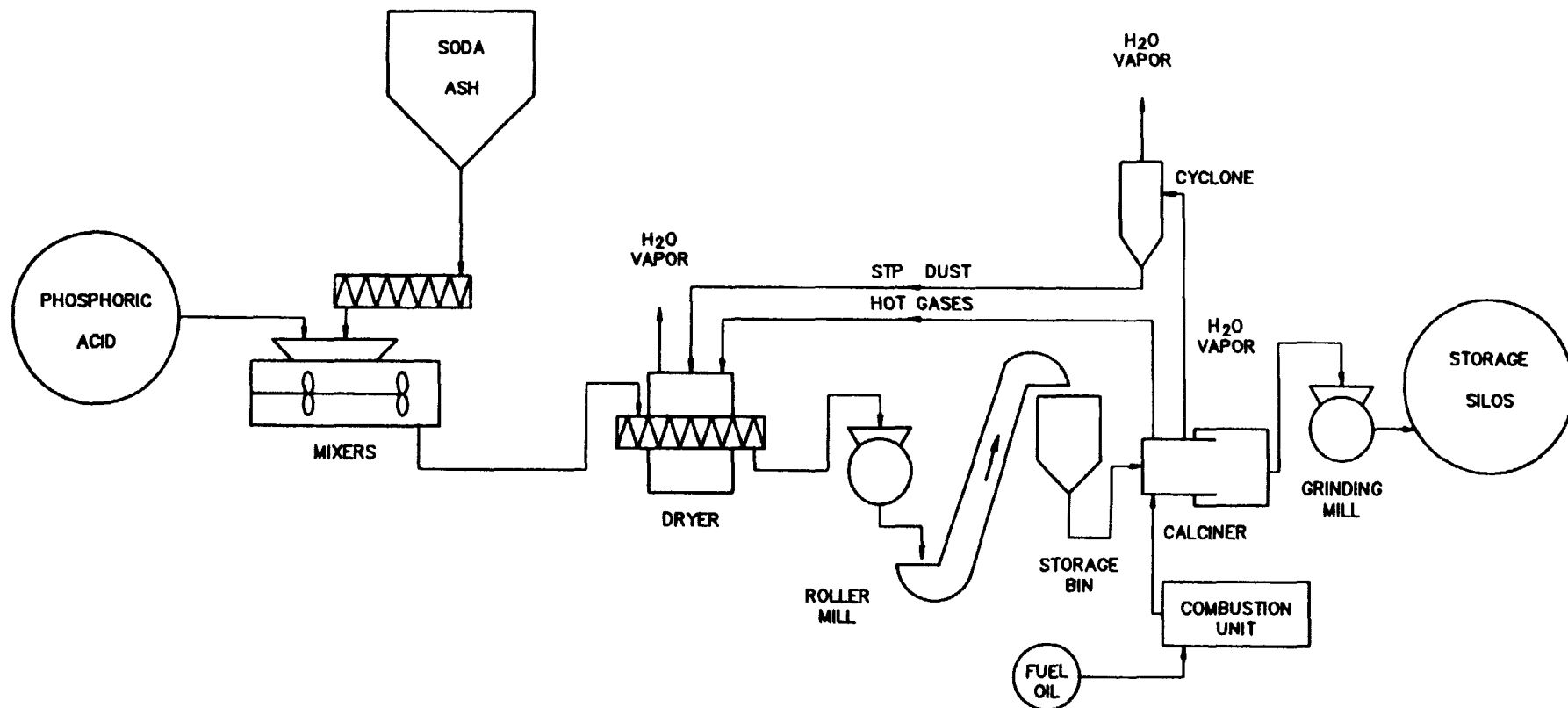
Approximately 8 acres at the eastern portion of the property is leased to American Presidential Intermodal Company (API), as presented in Item 1 (Attachment 1-A). API has covered the entire area with approximately 6-inches of asphalt. The area serves as a terminal to trucks.



| | | | |
|-----------------------------------------------------------------------------------------|---------------------|-------------|----------------------|
| Title:
GENERAL PROCESS DIAGRAM
PHOSPHORIC ACID

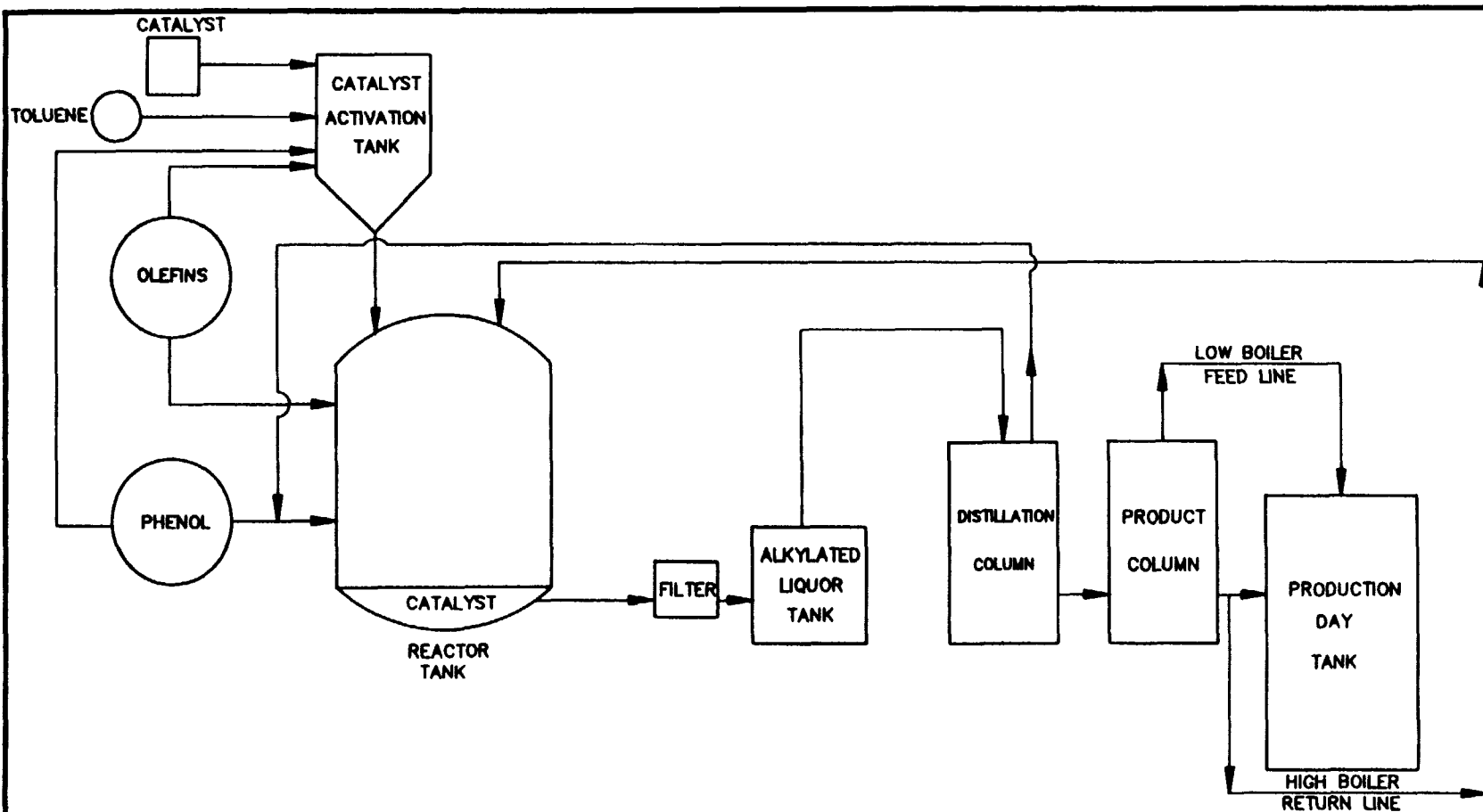
KEARNY PLANT | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.P. | Date: 07/81 | Figure
5.1 |
| | Prepared by: R.W. | Scale: NONE | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A43 | | |

850130062



| | | | |
|-----------------------------------------------------------------------------------------|---------------------|-------------|--------|
| Title: | | | |
| GENERAL PROCESS DIAGRAM
SODIUM TRIPOLYPHOSPHATE
(STP) | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.P. | Date: 07/71 | Figure |
| | Prepared by: M.J.V. | Scale: NONE | 5.2 |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A42 | | |

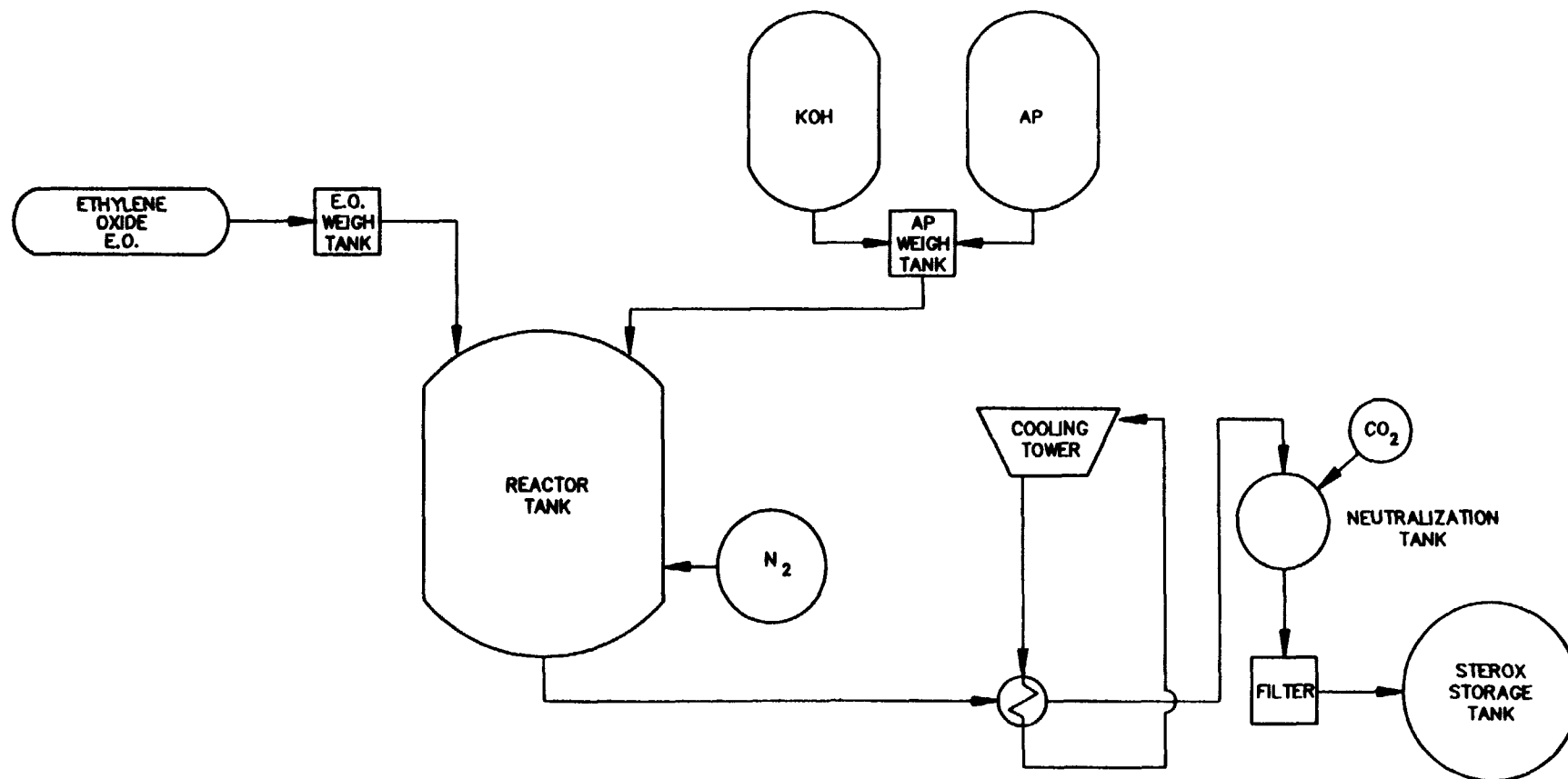
850130063



| | | | |
|----------------------------------------------------------------------------------------------------------------|---------------------|-------------|---------------------------------|
| <p>TITLE</p> <p>GENERAL PROCESS DIAGRAM</p> <p>ALKYLPHENOLS</p> <p>KEARNY PLANT</p> | | | |
| <p>Prepared for:</p> <p>MONSANTO COMPANY</p> | | | |
| <p>ROUX</p> <p>ROUX ASSOCIATES INC</p> <p>Consulting Ground-Water</p> <p>Geologists & Engineers</p> | Compiled by: J.P. | Date: 07/81 | <p>Figure</p> <p>5.3</p> |
| | Prepared by: R.W. | Scale: none | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A39 | | |

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| | | | |
|-----------------------------------------------------------------------------------------|---------------------|-------------|----------------------|
| Title: | | | |
| GENERAL PROCESS DIAGRAM
STEROX | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.P. | Date: 07/81 | Figure
5.4 |
| | Prepared by: M.J.V. | Scale: none | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A41 | | |

ATTACHMENT 7

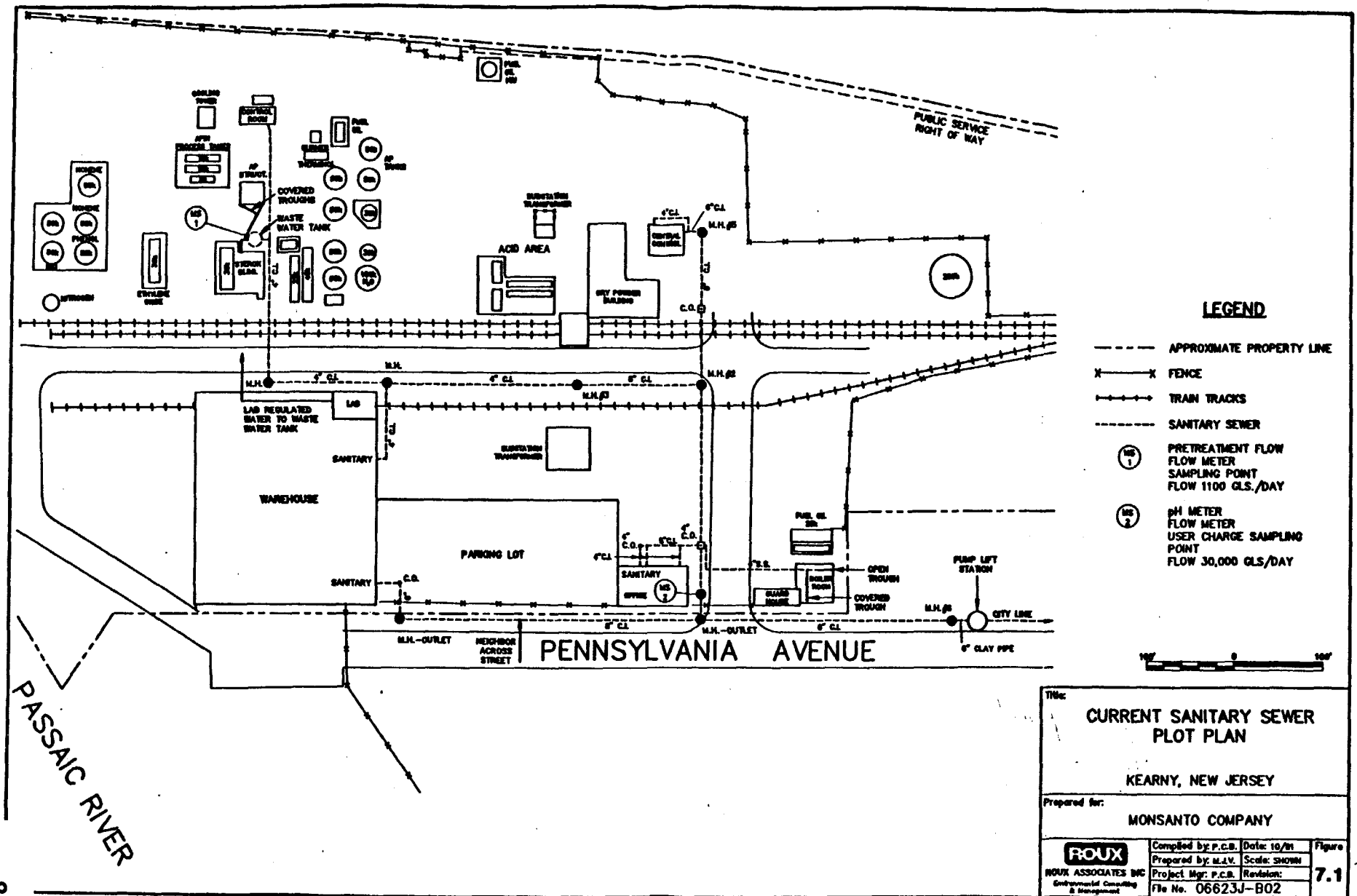
**Description of Past and Current Industrial
and Sanitary Waste Water Discharge (Item 7)**

Description of Past and Current Sanitary and Industrial Waste Water Discharges

Industrial and sanitary wastewater is discharged to an on-site sanitary sewer, which is permitted for connection to a publicly-owned treatment works operated by the Passaic Valley Sewerage Commissioners (PVSC). Two permitted sewerage connections occur on the site. They are described below, and an attached site map presents the current on-site sanitary sewage system.

Within the process area, industrial waste streams include the laboratory, Sterox® process (which is no longer in operation) and the AP process. Floating organic product possibly present are skimmed and separated to a tank for non-hazardous waste disposal. The combined water stream is sampled (monthly) for 32 priority pollutants. After treatment, the waste water is piped to the on-site sanitary sewer system where it is combined with sanitary waste water from the other on-site buildings. Before the waste water is discharged from the site, it is sampled for total suspended solids (TSS) and biological oxygen demand (BOD). The PVSC permits this sewage connection under permit number 15406751-00000-0151. Non-compliance with the permit has occurred on four occasions, and the details are presented in Attachment 3 of this submission.

A second permitted sewage connection from permit number 15406752-00000-0151 is monitored by a separate meter. This discharge includes only the sanitary waste from the warehouse. Prior to the 1990 connection to the PVSC the sewage system was connected to the Kearny Waste Water Treatment Plant, which has been closed.



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ATTACHMENT 8

Description of Current and Historical On-Site Containment of Hazardous Substances and Waste (Item 8)

**Current and Historical On-Site Containment
of Hazardous Substances and Waste**

Page 1 of 2

| Type of Storage Unit | Date Installed | Area or Volumetric Capacity
(include units) | Material Stored | Construction Type | Location Reference | Decommissioning ¹ or
Sampling Reference |
|--------------------------------|----------------|------------------------------------------------|--------------------------------------------------------|---------------------------------|--------------------|-------------------------------------------------------|
| Vertical Tank | 10/1960 | 50,000 Gal. | Phenol | Steel | AP Area | L7 |
| Vertical Tank | 10/1960 | 50,000 Gal. | Nonene | Steel | AP Area | L7 |
| Vertical Tank | 10/1960 | 50,000 Gal. | Propylene Tetramer | Steel | AP Area | L7 |
| Vertical Tank | 4/1980 | 573,000 Gal. | Propylene Tetramer | Steel | AP Area | L7 |
| Vertical Tank | 1979 | 700,000 Gal. | #4 Fuel Oil | Steel | AP Area | L7 |
| Vertical Tank | 9/1963 | 50,000 Gal. | α-Methyl Styrene | Steel | AP Area | L7 |
| Vertical Tank | 6/1983 | 50,000 Gal. | Maleic Anhydride | S.S. 304L | AP Area | L7 |
| Horizontal Tank | 10/1960 | 8,000 Gal. | #4 Fuel Oil | Steel | AP Area | L7 |
| Vertical Tank | 10/1960 | 100 Gal. | Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | Steel | AP Area | L7 |
| Horizontal Tank | 10/1960 | 15,000 Gal. | Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | Steel-Two Compartment | AP Area
AP Area | L7 |
| Horizontal Tank | 10/1960 | 7,000 Gal. | Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | Steel-One of Two
Compartment | AP Area | L7 |
| Vertical Tank | | 30,000 Gal. | Phenol/Nonene
Phenol/P. Tetramer | Steel | | |
| Horizontal Tank | 1/1958 | 8,000 | #4 Fuel Oil | Steel | Acid Area | L7 |
| Vertical Tank | 1955 | 15,000 Gal. | #4 Fuel Oil | Steel | STP Area | L7 |
| Horizontal
Underground Tank | 11/1978 | 900 Gal. | Gasoline | Steel | AP Area | Decommissioned 1976 |
| Horizontal Tank | 1960 | 40,000 Gal. | Ethylene Oxide | C.S. | Sterox | L7 |
| Storage Tank | 1967 | 8,000 Gal. | Nitric Acid | S.S. 304 | West End of Plant | L7 |
| Storage Tank | 1957 | 40,000 Gal. | Phosphoric Acid | C.S. Rubberlined | Acid Area | L7 |
| Storage Tank | 1957 | 40,000 Gal. | Phosphoric Acid | C.S. Rubberlined | Acid Area | L7 |
| Storage Tank | 1959 | 20,000 Gal. | Phosphoric Acid | S.S. 316 | Acid Area | L7 |

¹ Refer to Decommissioning/Decontamination, Item 12 (Attachment 12-A).

C.S. = Carbon Steel

S.S. = Stainless Steel

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**Current and Historical On-Site Containment
of Hazardous Substances and Waste**

Page 2 of 2

| Type of Storage Unit | Date Installed | Area or Volumetric Capacity
(include units) | Material Stored | Construction Type | Location Reference | Decommissioning¹ or
Sampling Reference |
|-----------------------------|-----------------------|--------------------------------------------------------|-----------------------------------|--------------------------|---------------------------|--------------------------------------------------------------|
| Storage Tank | 1958 | 10,000 Gal. | Phosphoric Acid | C.S. Rubberlined | Acid Area | L7 |
| Storage Tank | 1956 | 5,000 Gal. | Potassium Hydroxide | C.S. | Sterox Area
Fire Lane | L7 |
| Storage Tank | 1940 | 25,000 Gal. | Fuel Oil #4 or #6 | C.S. | North of Boiler Room | L7 |
| Storage Tank | 1956 | 14,000 Gal. | Fuel Oil #4 or #6 | C.S. | North of Acid | L7 |
| Storage | 1960 | 8,000 Gal. | Fuel Oil #4 or #6 | C.S. | AP Area | L7 |
| Weigh Tank | 1956 | 4,000 Gal. | Ethylene Oxide | C.S. | Sterox | L7 |
| 1 Transformer | 1956 | 150 Gal. | PCB Fluid in
Transformer | C.S. | STPI Roof | Decommissioned |
| 1 Transformer | 1965 | 150 Gal. | PCB Fluid in
Transformer | C.S. | Acid Area | Decommissioned |
| 1 Transformer | 1965 | 150 Gal. | PCB in Transformer
Fluid | C.S. | Warehouse Roof | Decommissioned |
| 14 55-gallon drums | 1990 | 3,843 K | Drill Cuttings
containing PCBs | Steel | Waste Storage | Removed 2/91 |
| 2 55-gallon drums | 1991 | 550 K | Drill Cuttings
containing PCBs | Steel | Waste Storage | Removed 8/91 |

¹ Refer to Decommissioning/Decontamination, Item 12 (Attachment 12-A).

C.S. = Carbon Steel

S.S. = Stainless Steel

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ATTACHMENT 9

**Current On-Site Hazardous Substance/Waste
Inventory (Item 9)**

**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 1 of 6

| | | | Storage Type | | | |
|-------------------------------------|------------------------------|---------------------|--------------|---------|-----------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Asbestos | Unknown | Insulation Shed | | | | NO |
| Hydraulic Oil | 1-10 lbs. | Maintenance Shop | Bottle | | Plastic | NO |
| Pneumatic Oil | 1-10 lbs. | Maintenance Shop | Bottle | | Plastic | NO |
| Gasoline | 11-100 lbs. | Maintenance Shop | Can | | Metal | NO |
| Waste Oil | 200 lbs. | Maintenance Shop | Drum | 55 Gal. | Steel | NO |
| Kerosene
(Gauge Oil-Red) | < 1 lb. | Maintenance Shop | Bottle | | Plastic | NO |
| Kerosene | 100-1000 lbs. | Maintenance Storage | Drum | 66 Gal. | Steel | NO |
| Kerosene
(Meridian D-2673) | 1-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Methyl Ethyl Ketone
(Weld-On) | 1-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Tetrahydrofuran
(Weld-On) | 1-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Cyclohexanone
(Weld-On) | 1-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Carbon Tetrachloride
(Gauge Oil) | 1-10 lbs. | Maintenance Shop | Bottle | | Plastic | NO |
| Mercury | 1-10 lbs. | Maintenance Shop | Bottle | | Glass | NO |
| Naptha | 1-10 lbs. | Maintenance Shop | | | | NO |
| Sodium Hydroxide
(DRANO) | 1-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Sodium Bisulfite
(RC 640) | 100 lbs. | Maintenance Shop | Drum | 20 Gal. | Fiber | NO |
| Battery, Wet | 100-1000 lbs. | Maintenance Shop | Case | | Plastic | NO |

C.S. = Carbon Steel
S.S. = Stainless Steel

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**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 2 of 6

| | | | Storage Type | | | |
|---------------------------------------------------|------------------------------|------------------|--------------|---------|-----------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Enamel Paint | 11-100 lbs. | Maintenance Shop | Can | | Metal | NO |
| Latex Paint | 11-10 lbs. | Maintenance Shop | Can | | Metal | NO |
| Acetylene Tetra Bromide
(Red Indicating Fluid) | 1-10 lbs. | Maintenance Shop | Bottle | | Glass | NO |
| Acetylene Tetra Bromide
(Meridian 924 BA #3) | 1-10 lbs. | Maintenance Shop | Bottle | | Glass | NO |
| Acetone | 10 lbs. | Laboratory | Bottle | 1 Gal. | Glass | NO |
| N-Butyl Acetate | 8 lbs. | Laboratory | Bottle | | Glass | NO |
| Chloroform | .5 lb. | Laboratory | Bottle | 500 ml | Glass | NO |
| Dichloromethane | 1-10 lbs. | Laboratory | Bottle | | Glass | NO |
| Hydrogen Chloride | 1-10 lbs. | Laboratory | Bottle | | Glass | NO |
| Phenol | < 1 lb. | Boiler Room | Bottle | 2 ounce | Plastic | NO |
| Phenol | 2 lbs. | Laboratory | Bottle | | Glass | NO |
| Ethyl Acetate | 3 lbs. | Laboratory | Bottle | 500 ml | Glass | NO |
| Hydrochloric Acid | 4 lbs. | Laboratory | Bottle | | Glass | NO |
| Methanol | 5 lbs. | Laboratory | Bottle | | Glass | NO |
| Methylene Chloride | 2 lbs. | Laboratory | Bottle | | Glass | NO |
| Nitric Acid | 2 lbs. | Laboratory | Bottle | | Glass | NO |
| Sulfuric Acid | 6 lbs. | Laboratory | Bottle | | Glass | NO |
| Isopropyl Alcohol | 10 lbs. | Laboratory | Bottle | | Glass | NO |
| Tetrahydrofuran | 1 lb. | Laboratory | Bottle | | Glass | NO |
| Xylene | 1 lb. | Laboratory | Bottle | | Glass | NO |
| Zinc | 5 lbs. | Laboratory | Bottle | | Glass | NO |

C.S. = Carbon Steel
S.S. = Stainless Steel

MO06623J.3.2

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**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 3 of 6

| | | | Storage Type | | | |
|--------------------------------------------|------------------------------|-------------|--------------|------------|-----------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Sodium Bisulfite
(RC 640) | 250 lbs. | Boiler Room | Drum | 20 Gal. | Fiber | NO |
| Sulfuric Acid | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Ammonium Hydroxide | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Ammonium Chloride | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Potassium Chromate | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Acetate Acid | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Hydrochloric Acid
(Sulfite P) | < 1 lbs. | Boiler Room | Bottle | 2 ounce | Plastic | NO |
| Nickel Sulfate | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Sodium Hydroxide
(Sulfite O) | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Sodium Hydroxide
(Sulfite Q) | < 1 lb. | Boiler Room | Bottle | 2 Ounce | Plastic | NO |
| Sodium Hydroxide
(Calgon EG5011) | 400 lbs. | Boiler Room | Drum | 55 Gal. | Plastic | NO |
| Sodium Sulfite | 300 lbs. | Boiler Room | Drum | 300 lbs. | Fiber | NO |
| Sodium Sulfite
(EG 537) | 600 lbs. | Warehouse | Drum | 300 lbs | Fiber | NO |
| Adipic Acid | 250,000-500,000 lbs. | Warehouse | Bag | 50 lbs. | Paper | NO |
| Adipic Acid | 100,000-250,000 lbs. | Warehouse | Super Bag | 2,000 lbs. | | NO |
| Nitrilo Triacetic Acid
(NTA), Trisodium | 100,000-250,000 lbs. | Warehouse | Bag | 50 lbs. | Paper | NO |
| Nitrilo Triacetic Acid
(NTA), Trisodium | 1,000-10,000 lbs. | Warehouse | Drum | 55 Gal. | Steel | NO |
| Toluene | Unknown | Warehouse | | | | NO |
| Fumaric Acid | 250,000-500,000 lbs. | Warehouse | Bag | 50 Lbs. | Paper | NO |

C.S. = Carbon Steel
S.S. = Stainless Steel

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MO06623J.3.2

**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 4 of 6

| | | | Storage Type | | | |
|-------------------------------------------------|------------------------------|------------|--------------|---------|-----------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Acetic Acid | 1,000-10,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Sodium Phosphate,
Dibasic | 250,000-500,000 lbs. | Warehouse | Bag | 50 Lbs. | Paper | NO |
| Sodium Phosphate,
Dibasic | 50,000-100,000 lbs. | Warehouse | Drum | 55 Gal. | Fiber | NO |
| Trisodium Phosphate,
Anhydrous | 100,000-250,000 lbs. | Warehouse | Bag | 50 Lbs. | Paper | NO |
| Hydrogen Chloride
(Dequest 2060) | 10,000-50,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Phosphoric Acid (70-80%) | 10,000-500,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Phosphoric Acid (80-90%) | 50,000-100,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Phosphoric Acid | 50 lbs. | Laboratory | Bottle | | Glass | NO |
| Phosphoric Acid, Ortho
(Dequest 2000 & 2010) | 100,000-250,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Phosphoric Acid, Ortho
(Dequest 2006, 40%) | 10,000-50,000 lbs. | Warehouse | Drum | 55 Gal. | Plastic | NO |
| Potassium Hydroxide | 6 lbs. | Laboratory | Bottle | | Glass | NO |
| Potassium Hydroxide | 1,000-10,000 lbs. | Warehouse | Bag | 50 Lbs. | Paper | NO |
| Potassium Hydroxide
90% Flakes | 100-1000 lbs. | Warehouse | Drum | 55 Gal. | Steel | NO |
| Potassium Hydroxide
(Wax Remover) | 11-100 lbs. | Warehouse | Drum | 10 Gal. | Plastic | NO |
| Benzoyl Peroxide
(Lucidol) | 100 lbs. | Warehouse | Box | 3 Lbs. | Fiber | NO |
| Zinc Chloride (Calgon) | 100 lbs. | Warehouse | Drum | 20 Gal. | Plastic | NO |
| Zinc Chloride
(Calgon 5770) | 50-500 lbs. | AP Area | Drum | 30 Gal. | Plastic | NO |

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C.S. = Carbon Steel
S.S. = Stainless Steel

MO06623J.3.2

**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 5 of 6

| | | | Storage Type | | | |
|--------------------------------------------------------|------------------------------|--------------------|-----------------|--------------|---------------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Hydrogen Chloride
(Calgon 5770) | 50-500 lbs. | AP Area | Drum | 30 Gal. | Plastic | NO |
| Phenol | 50,000 Gal. | AP Area | Vertical Tank | 50,000 Gal. | Steel | NO |
| Nonene | 50,000 Gal. | AP Area | Vertical Tank | 50,000 Gal. | Steel | NO |
| Propylene Tetramer | 50,000 Gal. | AP Area | Vertical Tank | 50,000 Gal. | Steel | NO |
| Propylene Tetramer | 573,000 Gal. | AP Area | Vertical Tank | 573,000 Gal. | Steel | NO |
| #4 Fuel Oil | 700,000 Gal. | AP Area | Vertical Tank | 700,000 Gal. | Steel | NO |
| α-Methyl Styrene | 50,000 Gal. | AP Area | Vertical Tank | 50,000 Gal. | Steel | NO |
| Maleic Anhydride | 50,000 Gal. | AP Area | Vertical Tank | 50,000 Gal. | S.S. 304L | NO |
| #4 Fuel Oil | 8,000 Gal. | AP Area | Horizontal Tank | 8,000 Gal. | Steel | NO |
| Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | 100 Gal. | AP Area | Vertical Tank | 100 Gal. | Steel | NO |
| Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | 15,000 Gal. | AP Area
AP Area | Horizontal Tank | 15,000 Gal. | Steel-Two Compartment | NO |
| Phenol/Nonene
Phenol/Tetramer
Phenol/α-M-Styrene | 7,000 Gal. | AP Area | Horizontal Tank | 7,000 Gal. | Steel-One of Two
Compartment | NO |
| Phenol/Nonene
Phenol/P. Tetramer | 30,000 Gal. | AP Area | Vertical Tank | 30,000 Gal. | Steel | NO |
| Ethylene Oxide | 40,000 Gal. | Sterox | Horizontal Tank | 40,000 Gal. | C.S. | NO |
| Nitric Acid | 8,000 Gal. | West End of Plant | Storage Tank | 8,000 Gal. | S.S. 304 | NO |
| Phosphoric Acid | 40,000 Gal. | Acid Area | Storage Tank | 40,000 Gal. | C.S. Rubberlined | NO |
| Phosphoric Acid | 40,000 Gal. | Acid Area | Storage Tank | 40,000 Gal. | C.S. Rubberlined | NO |
| Phosphoric Acid | 20,000 Gal. | Acid Area | Storage Tank | 20,000 Gal. | S.S. 316 | NO |
| Phosphoric Acid | 10,000 Gal. | Acid Area | Storage Tank | 10,000 Gal. | C.S. Rubberlined | NO |

C.S. = Carbon Steel
S.S. = Stainless Steel

MO06623J.3.2

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**Current Monsanto Kearny
Hazardous Substance/Waste Inventory**

Page 6 of 6

| | | | Storage Type | | | |
|---------------------|------------------------------|--------------------------|--------------|-------------|-----------------------------|-----------------------|
| Material Name | Quantity
(Pounds/Gallons) | Location | Type | Size | Material of
Construction | To Remain
on Site? |
| Potassium Hydroxide | 5,000 Gal. | Sterox Area
Fire Lane | Storage Tank | 5,000 Gal. | C.S. | NO |
| Fuel Oil #4 or #6 | 25,000 Gal. | North of Boiler Room | Storage Tank | 25,000 Gal. | C.S. | NO |
| Fuel Oil #4 or #6 | 14,000 Gal. | North of Acid | Storage Tank | 14,000 Gal. | C.S. | NO |
| Fuel Oil #4 or #6 | 8,000 Gal. | AP Area | Storage | 8,000 Gal. | C.S. | NO |

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C.S. = Carbon Steel
S.S. = Stainless Steel

MO06623J.3.2

ATTACHMENT 10-B

**Discharge History of Hazardous Substances and
Wastes (Item 10)**

Discharge History of Hazardous Substances and Waste

Discharge Addressed in 1989 ACO

Description of Discharge Event

Process waste was discharged to Acid Sump during purification of Phosphoric Acid. The waste was composed of arsenic sulfide (solid) at 1 to 5 percent concentration; phosphoric acid at 40 to 75 percent, filter aid at 25 to 40 percent

Process waste water was discharged from the Alkyl phenol/Sterox® processes to the Alkyl phenol/Sterox® Sump (AP/SS). Overflow was collected in the Secondary Settling Pond (SSP) and Tertiary Settling and (TSP).

In 1967 or 1968, PCB thermal heating fluid (2,000 gallons) was drained from the tank and heater to a trench which flowed to a designated disposal area (now referred to as the PCB Disposal Area (PDA). In 1972, PCB thermal heating fluid (2,000 gallons) was again discharged to the PDA.

Other Discharges

In late November 1990 concentrations of Toluene and Methylene Chloride in sanitary waste water exceeded permit limits, as described in Item 3.

On February 27, 1997, permitted limits for pH in sanitary waste water were violated, as described in Item 3.

Response and Resolution

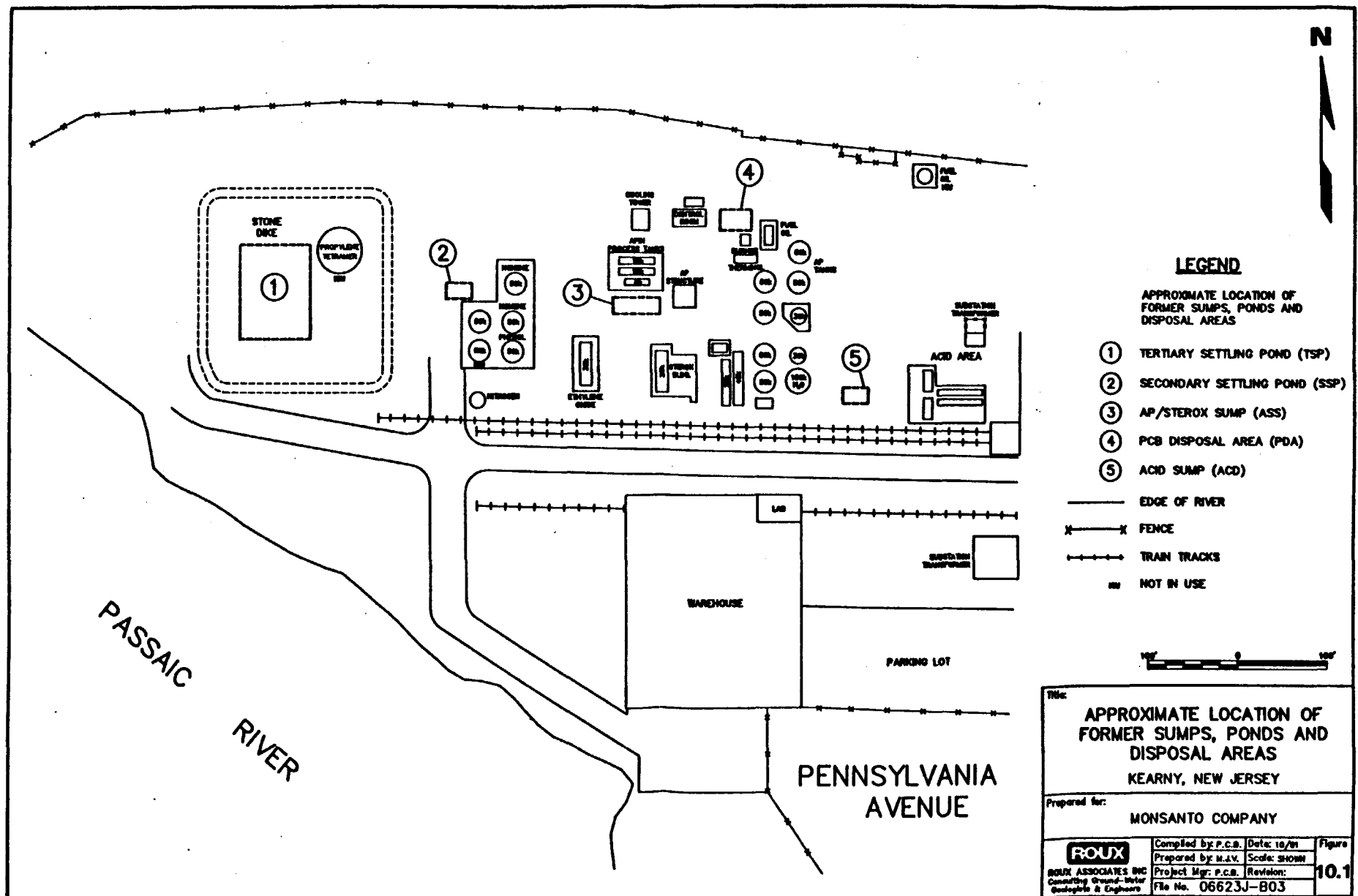
In-ground sump closed and replaced with above ground redwood tank. Environmental Remedial Investigation has been conducted under a 1989 ACO.

The in-ground sumps and ponds were closed. The waste water was then discharged as industrial waste to a public treatment works. Environmental Remedial Investigations were initiated in 1983 and followed under a subsequent ACO in 1989.

In 1972 the site converted to a non-chlorinated thermal fuel oil, Therminol 66. In 1983 an Environmental Investigation was initiated to determine the extent of PCB impact to soils and ground-water and followed under a subsequent ACO in 1989.

Monsanto modified the process which required Toluene and retrained personnel. Methylene Chloride is not an operations material or by-product. The source is not known.

Monsanto investigated possible sources; found cracks in dikes around a process unit which used phosphoric acid; and subsequently repaired the problem.



ATTACHMENT 11-A

**Justification for No Sampling Plan
Submission (Item 11)**

Justification for No Sampling Plan Submittal.

Monsanto Company submitted the Roux Associate's Inc. Remedial Investigation (RI) Work Plan, December 18, 1989, in partial fulfillment of an Administrative Consent Order (ACO) executed by New Jersey Department of Environmental Protection (the Department) on July 24, 1989. Subsequently Monsanto submitted to the Department, the Roux Associates, Inc. RI Work Plan - Addendum I (Addendum I), May 18, 1990 and a Revised RI Work Plan - Addendum II (Addendum II), May 3, 1991. The scope of work of the Remedial Investigation included:

- Sampling subsurface soil to delineate the vertical and horizontal extent of the identified areas of concern.

- Sampling surface soils within the targeted areas of concern and site background (perimeter) locations.

- Monitoring air quality during investigative subsurface activities.

- Installing additional monitoring wells.

- Abandoning former wells which had deteriorated or which were of questionable integrity.

- Evaluating seasonal and tidal fluctuations of ground water.

- Sampling ground water quarterly for 1 year to establish baseline conditions including an evaluation of ground-water elevations, flow direction, and quality.

- Delineating the extent and character, if any, of separate-phase, floating organics underlying the active process area.

- Conducting pumping tests to further define hydraulic parameters in both shallow and deep water-bearing units (zones).



- Preparing a risk assessment to confirm migration pathways, identify receptors, and determine the impact, if any, on human health and the environment.

Additionally the Roux Associate, Inc. RI Work Plan, December 18, 1989, also presented the results of previous on-site environmental investigations by Monsanto between 1983 and 1988. The results of the Roux Associates, Inc. Remedial Investigation and summaries of the previous on-site environmental investigations have been presented to the Department in the Draft Phase I of Phase II Remedial Investigation Report, October 5, 1990 and Preliminary Remedial Investigation Report, August 30, 1991. Additionally, Roux Associates, Inc. completed a data validation of a representative group of soil and ground-water samples. The results of the data validation are presented in two reports, Data Validation Report - Soil Sample Analysis, July 17, 1991 and Data Validation Report - Ground-Water Sample Analysis, July 17, 1991.

ATTACHMENT 12-A

Decontamination/Decommissioning Plan (Item 12)

THIS MAP CAN BE FOUND IN THE SITE FILE LOCATED AT: U.S. EPA SUPERFUND RECORDS
CENTER, 290 BROADWAY, 18TH FLOOR, NY, NY 10007

| | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------|----------------------|
|  | | | |
| Title: | | | |
| CURRENT SITE MAP | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| 
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by PCB | Date 10/81 | Figure
4.1 |
| | Prepared by M.S. | Date 10/81 | |
| | Project Mgr PCB | Revised | |
| | File No. | 06623J-DC1 | |

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ATTACHMENT 13-A

Summary Tables of Historic Analytical Data with Location Maps (Item 13)

Table M-1.1.1. Summary of Analytical Results of PCBs (Aroclor 1248) for Storch Engineers Soil Boring Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring Identification ¹ | Depth of Sampling Interval (In Feet BGS) | | | | | | | |
|------------------------------------|------------------------------------------|--------------------|---------|--------|-------|-------|-------|--------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 |
| B-1 | 21,300 | 23,800 | 38,100 | 5,660 | N/A | N/A | N/A | N/A |
| B-2A | 7,800 | 10,200 | 507,000 | 1,320 | N/A | N/A | N/A | N/A |
| B-3 | 4,600 | 4,020 | 5,820 | 1,610 | N/A | N/A | N/A | N/A |
| B-4A | 1,520 ² | 1,520 ² | NR | 4,450 | N/A | N/A | N/A | N/A |
| B-5 | 11,000 | 3,750 | 436,000 | 82,000 | N/A | N/A | N/A | N/A |
| B-6 | 36,000 | 548 | 412 | 682 | N/A | N/A | N/A | N/A |
| B-7 | 28,800 | 64,500 | 416 | <5 | N/A | N/A | N/A | N/A |
| B-8 | 8,980 | 26,400 | 6,160 | 33 | N/A | N/A | N/A | N/A |
| B-9 | 2,620 | 515 | 710 | 213 | N/A | N/A | N/A | N/A |
| B-10 | 32 | 27 | <5 | 5 | N/A | N/A | N/A | N/A |
| B-11 | 199 | 129 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-12 | 73 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-13 | 14 | 41 | 23 | 6 | N/A | N/A | N/A | N/A |
| B-14 | 1,970 | 164 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-15 | 14 | 7 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-16 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-17 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-18 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-19 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-20 | 53 | 36 | 17 | <5 | N/A | N/A | N/A | N/A |
| B-21 | 16 | 29 | 27 | <5 | N/A | N/A | N/A | N/A |
| B-22 | <5 | 10 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-23 | 6 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-24 | 21,500 | 19,500 | 195,000 | 960 | 97 | 130 | N/A | N/A |
| B-25 | 2,700 | NR | 98,500 | 29,500 | 3,100 | 63 | 1,400 | 16,500 |
| B-26 | 30,000 | 53,000 | 185,000 | 680 | 5,400 | 123 | 250 | 50 |
| B-27 | 8,500 | 51,000 | 53,000 | 32 | 960 | 100 | 910 | 260 |
| B-28 | 77 | NR | 10 | <5 | 6.2 | <5 | 33 | 43 |
| B-29 | <5 | 12 | 29 | 13 | N/A | N/A | N/A | N/A |

Results are reported in milligrams per kilogram (mg/kg).

Detection limit = 5 ppm

NR = No sample recovered during boring.

¹Borings B-1 to B23 and B-29 advanced to only 8 feet below ground surface.

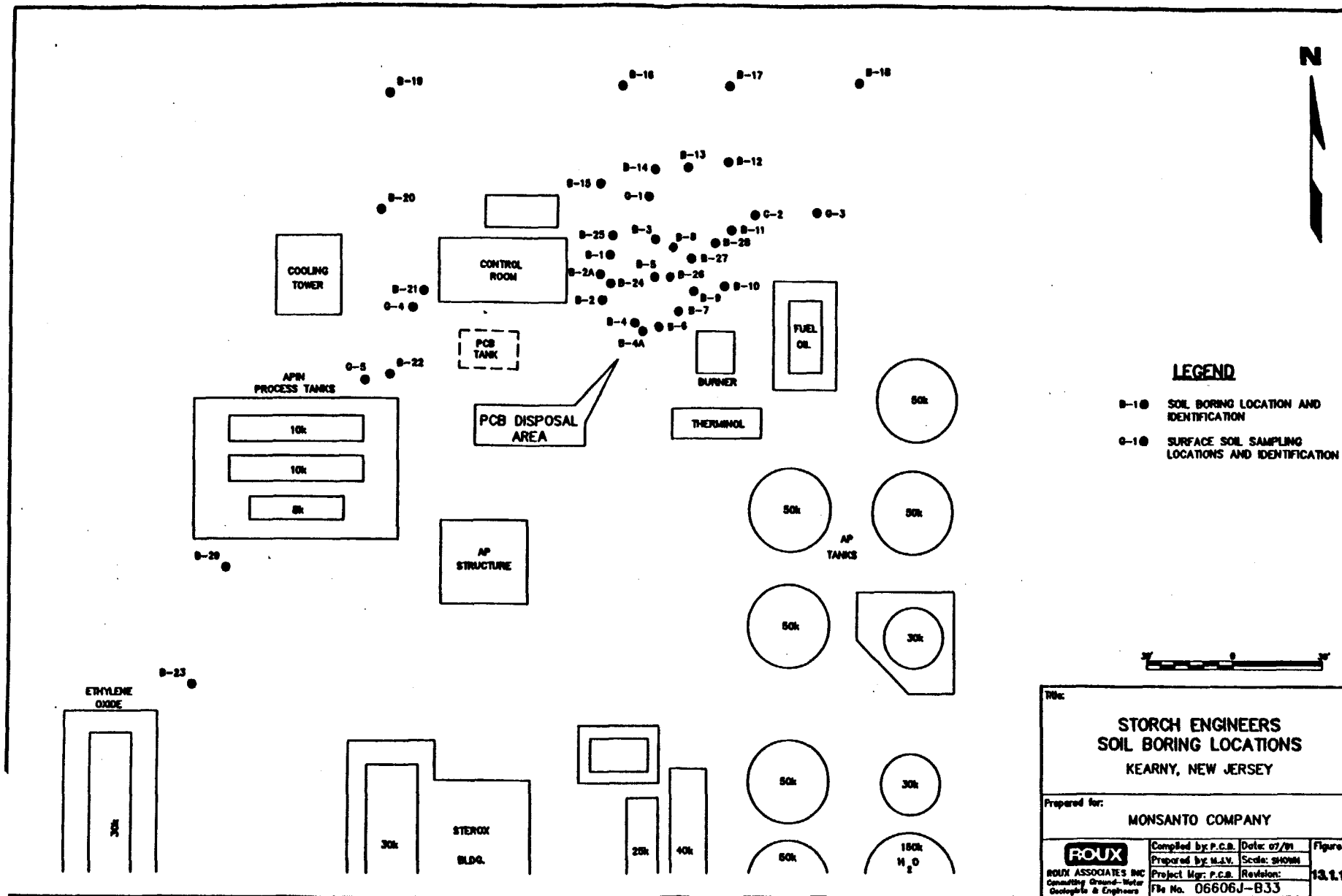
²Composite sample due to low recovery.

N/A = Not analyzed.

Samples were collected between September 1983 and February 1984.

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| | | | |
|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--|
| <p>STORCH ENGINEERS
SOIL BORING LOCATIONS
KEARNY, NEW JERSEY</p> | | | |
| <p>Prepared for:
MONSANTO COMPANY</p> | | | |
| <p>ROUX
ROUX ASSOCIATES INC.
Consulting Ground-Water
Geologists & Engineers</p> | <p>Compiled by: P.C.B. Date: 07/81
Prepared by: M.A.V. Scale: SHOWN
Project Mgr: P.C.B. Revision:
File No. 06606J-B33</p> | <p>Figure
13.1.1</p> | |

Table M-1.2.1 Summary of Analytical Results of PCBs (Aroclor 1248) for OHM Phase I Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring
Identification | Depth of Sampling Interval (In Feet BGS) | | | | | | | | | | | | | |
|--------------------------|------------------------------------------|---------|--------|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 |
| S-1 | BDL | BDL | -- | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S-2 | 1 | BDL | -- | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S-3 | BDL | 146 | 23 | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S-4 | 2 | 1 | 227 | 818 | 1 | BDL | -- | -- | -- | -- | -- | -- | -- | -- |
| S-5 | 4 | 2 | 31 | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S-6 | 644 | 467 | 10,500 | 12 | 18 | 1 | 11 | -- | -- | -- | -- | -- | -- | -- |
| S-7 | BDL | BDL | -- | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S-8 | BDL | 3 | BDL | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| D-1 | BDL | 1 | BDL | BDL | -- | -- | -- | 3 | -- | -- | -- | -- | -- | -- |
| D-2 | BDL | BDL | -- | -- | -- | -- | -- | BDL | -- | -- | -- | -- | -- | -- |
| 3-D | BDL | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 9-D* | 22,900 | 123,000 | 5,960 | 499 | 92 | 76 | 153 | 1 | BDL | BDL | 10 | 20 | 2 | 6 |
| 10-D | 1 | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 11-D | BDL | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12-D | BDL | -- | BDL | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

Concentration in parts per million (ppm).

Detection Limit = 1.0 ppm.

BDL = Below detection limit.

* Only samples from boring 9-D were analyzed at each interval to depth.

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1000000000

Table M-1.2.2 Summary of Analytical Results for Aqueous Samples for OHM Phase I Test Pits. Monsanto Kearny Plant. Kearny, New Jersey.

| | Test Pit Identification | | | |
|------------------------------------------------------|-------------------------|------|---------------------|------|
| | TP9 | TP10 | TP11 ^{4,5} | TP12 |
| Volatile Organic Compounds (VOCs)¹ | | | | |
| Trichloroethane | BDL | BDL | 29,000 | BDL |
| Toluene | BDL | BDL | 234,000 | BDL |
| Bis-(1,1-Dimethylethyl)-Diazene | BDL | BDL | 80,000 | BDL |
| 2,3-Dimethylhexane | BDL | BDL | 6,000 | BDL |
| 3,3-Dimethylhexanol | BDL | BDL | 26,000 | BDL |
| 2,2,4-Trimethylhexane | BDL | BDL | 17,000 | BDL |
| 2,3-Dimethylheptane | BDL | BDL | 3,000 | BDL |
| Methylcyclopentane | BDL | BDL | 230,000 | BDL |
| 3-Ethyl-3-Methylhexane | BDL | BDL | 324,000 | BDL |
| Xylenes | BDL | BDL | 68,000 | BDL |
| Priority Pollutant Metals² | | | | |
| Arsenic | BDL | BDL | BDL | 0.05 |
| Copper | BDL | 0.35 | BDL | BDL |
| Selenium | 0.01 | BDL | BDL | BDL |
| Zinc | 0.60 | 0.72 | 0.31 | 0.40 |
| PCB (Aroclor 1248) ³ | 0.124 | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Detection limit is 0.01 ppm.

²Detection limits for Arsenic = 0.01 ppm; Copper = 0.2 ppm; Selenium = 0.01 ppm; and Zinc = 0.2 ppm.

³Detection limit = 1 ppb.

⁴Aqueous sample for TP11 included separate, free-phase, floating product.

⁵Detection limit for VOCs and PCBs in sample TP11 is 10 ppm.

Samples were collected in October 1984.

Table M-1.2.3. Summary of Analytical Results for OHM Ground-Water Samples. October 1984. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|------------------------------------------|-----------------------|-----|-----|-----|-----|-----|-----|-------|-----|-----|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 295 | 17 | BDL |
| Bromomethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 180 | BDL | BDL |
| Bromoform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 108 | BDL | BDL |
| Carbon Tetrachloride | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 125 | BDL | BDL |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 248 | 91 | BDL |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 178 | BDL | BDL |
| Dibromochloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 190 | BDL | BDL |
| 1,1-Dichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 72 | BDL | BDL |
| 1,2-Dichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 51 | BDL | BDL |
| 1,2-Dichloropropane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 246 | BDL | BDL |
| Trans,-1,3-Dichloropropene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 213 | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 285 | BDL | BDL |
| Methylene Chloride | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 362 | BDL | BDL |
| 1,1,2,2-Tetrachloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 194 | BDL | BDL |
| Tetrachloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 220 | BDL | BDL |
| 1,1,1-Trichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 132 | BDL | BDL |
| 1,1,2-Trichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 202 | BDL | BDL |
| Trichloroethene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 389 | BDL | BDL |
| Toluene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 339 | BDL | BDL |
| Total VOCs | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 4,029 | 108 | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

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Table M-1.2.3. Summary of Analytical Results for OHM Ground-Water Samples. October 1984. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | BDL | BDL | 22 | BDL | 12 | BDL | BDL | BDL | 16 | BDL |
| Bis(2-ethylhexyl)-phthaate | 20 | 11 | 20 | 22 | 21 | 32 | 12 | 19 | 33 | 21 |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 17 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 104 | BDL |
| Fluoranthene | BDL | 21 | BDL | BDL | 18 | BDL | BDL | BDL | BDL | BDL |
| Flourene | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Naphthalene | BDL | BDL | 20 | BDL | 65 | 186 | BDL | BDL | 28 | BDL |
| N-Nitrosodiphenylamine | BDL | BDL | 19 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Phenanthrene | BDL | 20 | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | 20 | BDL | BDL | 14 | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 20 | 72 | 91 | 22 | 140 | 218 | 12 | 19 | 198 | 21 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| 2,4-Dimethylphenol | BDL | BDL | BDL | BDL | BDL | 34 | BDL | BDL | BDL | BDL |
| Phenol | BDL | BDL | BDL | BDL | 261 | BDL | BDL | BDL | BDL | BDL |
| Total AEs | BDL | BDL | BDL | BDL | 261 | 34 | BDL | BDL | BDL | BDL |
| PCB (Aroclor 1248) | BDL | 22.6 | BDL | BDL | 1.2 | BDL | 5.7 | 1.6 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).
BDL = Below detection limit.

850130092

Table M-1.2.4. Summary of Analytical Results of PCBs (Aroclor 1248) for Ground-Water Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Sample Identification | October 1984 | August 1986 ¹ | April 1987 | December 1987 | April 1988 |
|-----------------------|--------------|--------------------------|-------------------|---------------|------------|
| 3S | BDL | BDL | BDL | NA | NA |
| 3D | BDL | BDL | NA | NA | NA |
| 5S | NA | NA | NA | 1.5 | NA |
| 8S | NA | NA | BDL | NA | NA |
| 9S | 22.6 | 2.8 ² | 131 | 6.0 | 99.3 |
| 9D | 5.7 | BDL | 6.2 ³ | 20.0 | 24.2 |
| 10S | BDL | BDL | BDL | BDL | BDL |
| 10D | 1.6 | BDL | BDL | BDL | BDL |
| 11S | BDL | BDL | 1.35 ⁴ | BDL | BDL |
| 11D | BDL | BDL | BDL | BDL | BDL |
| 12S | 1.2 | BDL | BDL | BDL | BDL |
| 12D | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

Detection Limit = 1 ppb, unless noted.

BDL = None detected.

NA = Not analyzed.

¹Detection Limit varied up to 35 ppb.

²Aroclor 1260.

³Aroclor 1232, Aroclor 1221, and Aroclor 1016 detected at 6.2 ppb.

⁴Aroclor 1242.

850130093

Table M-1.2.5. Summary of Analytical Results for Monsanto Ground-Water Samples. March 1985. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | | |
|--------------------------------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------------------|----------------------|-------------|
| | Well 1S | Well 2S | Well 3S | Well 4S | Well 5S | Well 6S | Well 7S | Well 8S | Well 9 ¹ | Well 10 ² | Field Blank |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | |
| Bromodichloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 10 | BDL |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 34 | 80 | BDL |
| Methylene Chloride | BDL | 7 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | BDL | 7 | BDL | BDL | BDL | BDL | BDL | BDL | 34 | 90 | BDL |
| Base/Neutral Extractable Semi-Volatile Compounds (BNs) | | | | | | | | | | | |
| Acenaphthene | BDL | BDL | BDL | BDL | BDL | 15 | BDL | BDL | BDL | BDL | BDL |
| Benzo (A) Anthracene | BDL | BDL | BDL | BDL | BDL | 29 | BDL | BDL | BDL | BDL | BDL |
| Benzo (K) Fluoranthene | 10 | BDL | BDL | BDL | BDL | 18 | BDL | BDL | BDL | BDL | BDL |
| Benzo (A) Pyrene | BDL | BDL | BDL | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL |
| Fluoranthene | BDL | BDL | BDL | BDL | BDL | 28 | BDL | BDL | BDL | BDL | BDL |
| Fluorene | BDL | BDL | BDL | BDL | BDL | 19 | BDL | BDL | BDL | BDL | BDL |
| Naphthalene | BDL | BDL | BDL | BDL | BDL | 128 | BDL | BDL | BDL | BDL | BDL |
| Phenanthrene | BDL | BDL | BDL | BDL | BDL | 33 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | BDL | BDL | BDL | BDL | 13 | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 10 | BDL | BDL | BDL | BDL | 293 | BDL | BDL | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | | |
| Arsenic | BDL | BDL | BDL | BDL | BDL | BDL | 20 | BDL | BDL | BDL | 7 |
| Cadmium | 20 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Chromium | 14 | 50 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Copper | 10 | BDL | 40 | BDL | BDL | BDL | BDL | BDL | 240 | BDL | BDL |
| Lead | 50 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 120 | BDL | BDL |
| Zinc | 20 | BDL | 130 | 20 | 100 | BDL | BDL | BDL | 340 | 70 | 140 |
| Total Phenols | 190 | 20 | 20 | 140 | 130 | 100 | 20 | 120 | 50 | 20 | 350 |
| Total PCBs ³ | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Discharge to POTW.

²Kearny City Water.

³Detection limit was 50 ppb.

850130094

Table M-1.2.6. Summary of Analytical Results for Monsanto Ground-Water Samples. October 1985. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|---------------------------------------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------------------|----------------------|
| | Well 1S | Well 2S | Well 3S | Well 4S | Well 5S | Well 6S | Well 7S | Well 8S | Well 9 ¹ | Well 10 ² |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | 1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Bromodichloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 10 |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2 | 35 | 46 |
| Methylene Chloride | BDL | BDL | BDL | BDL | 280 | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | BDL | 1 | BDL | BDL | 280 | BDL | BDL | 2 | 35 | 56 |
| Base/Neutral Extractable Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | BDL | BDL | BDL | BDL | BDL | BDL | 12 | BDL | BDL | BDL |
| Fluoranthene | BDL | BDL | BDL | BDL | BDL | BDL | 13 | BDL | BDL | BDL |
| Total BNs | BDL | BDL | BDL | BDL | BDL | BDL | 25 | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | |
| Antimony | 67 | BDL | 16 | 19 | 65 | 130 | BDL | 70 | BDL | BDL |
| Arsenic | BDL | BDL | BDL | BDL | 80 | 11 | 58 | BDL | BDL | BDL |
| Chromium | 80 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 80 | BDL |
| Copper | 30 | BDL | 90 | 20 | 100 | BDL | BDL | 30 | 60 | 60 |
| Lead | 100 | BDL | BDL | 150 | 150 | 60 | BDL | BDL | 100 | BDL |
| Mercury | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2 | BDL | BDL |
| Nickel | 120 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Selenium | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 30 | BDL | BDL |
| Zinc | 90 | 260 | 470 | 70 | 290 | 320 | BDL | BDL | 480 | 360 |
| Total PCBs ³ | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Discharge to POTW.

²Kearny City Water.

³Detection limit was 50 ppb.

850130095

**Table M-1.2.7. Summary of Analytical Results for OHM Ground-Water Samples. August, 1986. Monsanto Kearny Plant.
Kearny, New Jersey.**

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|------------------|------------------|-------|------|------------------|------------------|------------------|------------------|------------------|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | 13.5 | 13.6 | 8.1 | BDL | BDL | 13.2 | 33.5 |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | 247 | BDL | 688 | 61.7 | 9.6 |
| Chloroform | 3.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | 39.5 | BDL | BDL | BDL | BDL | 15.5 | BDL |
| Methylene Chloride | BDL | 6.0 | 9.7 | 19.9 | 9.3 | 7.5 | 5.9 | 6.1 | 13.2 | BDL |
| 1,1,1-Trichloroethane | BDL | 4.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Toluene | BDL | BDL | BDL | 59.5 | BDL | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | 3.6 | 10.8 | 9.7 | 132.4 | 22.9 | 262.6 | 5.9 | 674.1 | 103.6 | 43.1 |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | BDL | 5.5 | 25.4 | 9.1 | 16.0 | 3.6 | 7.3 | 8.4 | 6.0 | 5.1 |
| Anthracene | BDL | BDL | BDL | BDL | 3.4 | BDL | BDL | BDL | BDL | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 21.2 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 7.1 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 28.7 | 48.3 | BDL |
| Fluoranthene | BDL | 3.6 | 9.6 | BDL | 9.4 | BDL | BDL | BDL | BDL | BDL |
| Flourene | BDL | 2.9 | 7.5 | 4.2 | 5.3 | BDL | BDL | 2.9 | BDL | BDL |
| Naphthalene | BDL | BDL | 4.6 | 4.6 | 22.4 | 60.8 | BDL | BDL | 9.1 | BDL |
| Phenanthrene | BDL | 5.9 | BDL | BDL | 10.3 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | 3.4 | 7.7 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Total BNs | BDL | 21.3 | 54.8 | 17.9 | 66.8 | 64.4 | 7.3 | 61.2 | 70.5 | 5.1 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| 2-Chlorophenol | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 13.0 | BDL | BDL |
| 2,4-Dimethylphenol | BDL | BDL | BDL | 3.4 | BDL | 9.0 | BDL | BDL | 11.9 | BDL |
| Phenol | BDL | BDL | BDL | 8.0 | BDL | BDL | BDL | BDL | BDL | 4.9 |
| Total AEs | BDL | BDL | BDL | 11.4 | BDL | 9.0 | BDL | 13.0 | 11.9 | 4.9 |
| PCB (Aroclor 1248) | BDL ¹ | BDL ² | BDL ¹ | BDL | BDL | BDL ¹ | BDL ¹ | BDL ¹ | BDL ¹ | BDL ¹ |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below minimum detection limit.

¹Detection limit varied up to 35 ppb.

²Aroclor 1260 detected at 2.8 ppb.

850130096

Table M-1.2.8. Summary of Analytical Results for OHM Ground-Water Samples. April 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|-----|------|------|------|------|------|-------|-------|------|
| | 3S | 8S | 9S | 10S | 11S | 12S | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | 9.2 | 14.6 | BDL | BDL | BDL | 20.3 | BDL |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 4,270 | 109 | 12.9 |
| Chloroform | BDL | BDL | 1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | BDL | 11.9 | BDL | BDL | BDL | BDL | BDL |
| Methylene Chloride | 8.9 | 3.2 | 4.3 | 6.5 | 11.7 | 355 | 3.4 | BDL | 12.2 | 7.5 |
| Toluene | BDL | BDL | BDL | BDL | 26.6 | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | 8.9 | 3.2 | 5.3 | 15.5 | 65.5 | 355 | 3.4 | 4,270 | 141.5 | 20.5 |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | 7 | 2.3 | 4.1 | 38.5 | 11.1 | 9 | 3.5 | 9.9 | 10.7 | 7.3 |
| Anthracene | BDL | BDL | 2.9 | 2.8 | BDL | 2.3 | BDL | BDL | BDL | BDL |
| Bis(2-ethylhexyl)-phthalate | BDL | BDL | BDL | BDL | BDL | BDL | 19.2 | BDL | BDL | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 81.1 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 7.6 | 16.9 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 133 | 101 | BDL |
| Fluoranthene | BDL | BDL | 3.3 | 5 | BDL | 2.5 | BDL | BDL | BDL | BDL |
| Flourene | BDL | BDL | 2.5 | 17.5 | 5.2 | 3.3 | BDL | 3.9 | BDL | BDL |
| Naphthalene | 8.3 | BDL | BDL | 15.4 | 4.4 | 9.7 | BDL | 13.2 | 4.2 | BDL |
| Phenanthrene | BDL | BDL | 7.6 | 13.1 | 5.8 | 7.4 | BDL | BDL | BDL | BDL |
| Pyrene | BDL | BDL | 2.9 | 4 | BDL | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 15.3 | 2.3 | 23.4 | 96.3 | 26.4 | 34.5 | 22.7 | 258.2 | 115.9 | 7.3 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| Phenol | BDL | BDL | 8.8 | BDL | 2.7 | BDL | 2.1 | 1.9 | BDL | BDL |
| Total AEs | BDL | BDL | 8.8 | BDL | 2.7 | BDL | 2.1 | 1.9 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Aroclor 1242 detected at 1.35 ppb.²Aroclor 1232, Aroclor 1221, and Aroclor 1016 (all detected at 6.2 ppb).

850130097

Table M-1.2.8. Summary of Analytical Results for OHM Ground-Water Samples. April 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------|-----------------------|-----|-----|-----|------------------|-----|------------------|-----|-----|-----|
| | 3S | 8S | 9S | 10S | 11S | 12S | 9D | 10D | 11D | 12D |
| PCB (Aroclor 1248) | BDL | BDL | 131 | BDL | BDL ¹ | BDL | 6.2 ² | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | |
| Antimony | 38 | 63 | BDL | 25 | BDL | BDL | BDL | 170 | BDL | BDL |
| Arsenic | 78 | 76 | 110 | 43 | BDL | BDL | BDL | 4 | BDL | BDL |
| Beryllium | BDL | BDL | 2.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Cadmium | BDL | BDL | 4.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Chromium | BDL | BDL | 200 | BDL | BDL | BDL | BDL | BDL | BDL | 22 |
| Copper | BDL | BDL | 340 | BDL | 12 | 14 | 24 | 20 | 14 | 30 |
| Lead | BDL | BDL | 800 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Mercury | BDL | BDL | 1.9 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Nickel | 20 | BDL | 160 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Selenium | BDL | BDL | BDL | 1 | BDL | BDL | BDL | 1 | BDL | BDL |
| Silver | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 20 | BDL | BDL |
| Thallium | 150 | 140 | BDL | BDL | BDL | BDL | BDL | 300 | BDL | BDL |
| Zinc | 30 | 40 | 820 | BDL | 20 | BDL | BDL | BDL | BDL | 50 |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Aroclor 1242 detected at 1.35 ppb.

²Aroclor 1232, Aroclor 1221, and Aroclor 1016 (all detected at 6.2 ppb).

850130098

Table M-1.2.9. Summary of Analytical Results for OHM Ground-Water Samples. December 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|------------------|----------------|------------------|------|------|------|-----------------|-----------------|------|-------|-----|
| | 1S | 5S | 9S | 9S* | 10S | 11S | 12S | 9D | 9D* | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | | |
| Benzene | BDL | 4.9 | BDL | NA | BDL | BDL | BDL | 4.7 | NA | BDL | 14.7 | BDL |
| Chlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 218 | 89.9 | BDL |
| Methylene Chloride | 25.2 | BDL | BDL | NA | BDL | 90.9 | BDL | BDL | NA | BDL | BDL | BDL |
| Total VOCs | 25.2 | 4.9 | BDL | NA | BDL | 90.9 | BDL | 4.7 | NA | 218 | 104.6 | BDL |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | | | |
| Acenaphthene | 2.6 | 7.7 | 7.1 | NA | 26.7 | 8.8 | 6.6 | 22.9 | NA | 8.9 | 11 | BDL |
| Anthracene | BDL | BDL | BDL | NA | 3.1 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Bis(2-ethylhexyl)-phthalate | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | 17.9 | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 12.3 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | 12.5 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 29.7 | 77.4 | BDL |
| Fluoranthene | BDL | 2.4 | 3.7 | NA | 9 | BDL | 4 | BDL | NA | BDL | BDL | BDL |
| Fluorene | BDL | BDL | BDL | NA | 13.2 | 5.6 | 2.7 | 4.9 | NA | 2.7 | BDL | BDL |
| Naphthalene | BDL | BDL | BDL | NA | 21.3 | 7.8 | 7.4 | BDL | NA | 1.9 | 4.3 | BDL |
| Phenanthrene | BDL | BDL | BDL | NA | 18.7 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Pyrene | BDL | BDL | BDL | NA | 7.2 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Total BNs | 2.6 | 10.1 | 10.8 | NA | 99.2 | 22.2 | 20.7 | 27.8 | NA | 55.5 | 123.1 | BDL |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | | | |
| 2-Chlorophenol | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 3.3 | BDL | BDL |
| Phenol | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Total AEs | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 3.3 | BDL | BDL |
| PCB ¹ | BDL | 1.5 ² | 6 ² | 6.2 ³ | BDL | BDL | BDL | 20 ³ | 21 ³ | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

NA = Not Analyzed.

¹Detection Limit Fluctuated from 1.3 to 0.50 ppb.

²Aroclor 1248

³Aroclor 1016.

⁴Aroclor 1254 and Aroclor 1260.

* Filtered sample only analyzed for PCBs.

Table M-1.3.1. Summary of Analytical Results of PCBs (Aroclor 1248) for OHM Phase II Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring
Identification | Depth of Sampling Interval (In Feet) | | | | |
|--------------------------|--------------------------------------|-----|-----|-----|------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 |
| A | 6 | 84 | 46 | 1 | 7 |
| B | 49 | 19 | BDL | N/A | N/A |
| C | 144 | 22 | 14 | 21 | BDL |
| D | 2 | 8 | 4 | BDL | N/A |
| E | 1 | 7 | 1 | BDL | N/A |
| F | 3 | 22 | 9 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

Detection Limit = 1.0 ppm.

BDL = Below detection limit.

N/A = Not sampled.

Samples were collected in November and December 1989.

ATTACHMENT 13-B

**Summary of Roux Associates, Inc. Remedial
Investigation Data for Ground-Water Samples
with Location Maps (Item 13)**

Table M-2.1 Summary of Analytical Results of Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | | 4s | | | | 6s | | | | 8s | | | |
|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------|------|------------------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | BDL ^a | ND | ND | ND | ND | ND | 10 | ND | ND | 14 | BDL ^a | ND | BDL ^a |
| Benzene | ND | ND | BDL | ND | ND | ND | ND | ND | ND | 5.1 | ND | BDL | ND | BDL | BDL | ND |
| Ethylbenzene | ND | ND | ND | ND | ND | ND | 6 | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND |
| Xylene | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | BDL | 6 | BDL | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | BDL | BDL | BDL |
| Carbon Disulfide | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| | 9s | | | | 11s | | | | 12s | | | | 15s | | | |
|------------------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------------------|------|-----------------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | 12 ^a | 15 | ND | ND | 12 ^a | 11 | ND | ND | BDL ^a | BDL | ND ^a | ND | BDL ^a |
| Benzene | ND | ND | ND | 19 | 140 | 7 | 60 | 320 ^d | ND | BDL | BDL | 12 | BDL | 11 | 10 | 12 ⁱ |
| Ethylbenzene | ND | ND | ND | ND | 69 | 23 | BDL | 44 ⁱ | ND | ND | ND | BDL | BDL | 10 | 9 | 15 ⁱ |
| Toluene | ND | ND | ND | ND | BDL | 6 | ND | 15 ⁱ | ND | ND | ND | ND | 8 | 27 | 22 | 22 ⁱ |
| Xylene | ND | ND | ND | ND | 12 | 3 | BDL | 10 | ND | BDL | NDL | BDL | 10 | 25 | 23 | 31 ⁱ |
| Chlorobenzene | ND | ND | ND | BDL | ND | BDL | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND |
| Carbon Disulfide | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 15 | ND | ND | ND | BDL |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

^aThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

^cSample was diluted to bring concentrations in calibration range.

Results are reported in micrograms per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

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Table M-2.2 Summary of Analytical Results of Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 6d | | | | 7d | | | | 8d | | | | 9d | | | |
|-----------------|------|------|------|------------------|------|------|------|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | BDL ¹ | 11 | ND | ND | BDL ¹ | BDL | ND | ND | BDL ¹ | ND | ND | ND | ND | 58 | ND | ND | ND |
| Benzene | 19 | ND | NDL | ND | ND | ND | ND | ND | 19 | BDL | BDL | ND | 31 | 19 | BDL | 40 | BDL | 10 | BDL | BDL |
| Chlorobenzene | 4400 | 5600 | 5900 | 5300 | ND | ND | ND | ND | 810 | 830 | 760 | 810 | 960 | 620 | 820 | 590 | 660 | 600 | 400 | 500 |
| Chloroform | ND | ND | ND | ND | 10 | ND | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND |
| Ethylbenzene | 10 | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | BDL | ND | ND |
| Toluene | BDL | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | 7 | ND | ND | 22 | ND | ND | ND | ND |
| Xylenes (total) | 7 | ND | ND | ND | ND | ND | BDL | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND |

| | 10d | | | | 11d | | | | 12d | | | | 14d | | | | 15d | | | |
|-----------------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------|------|------------------|------|-----------------|------|------|------|-------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | 76 ² | 18 | 12 | ND | BDL ³ | 49 | 20 | ND | ND | BDL | BDL ³ | ND | ND | 20 | ND | ND | 71 ³ |
| Benzene | ND | ND | ND | BDL | 8 | BDL | BDL | 5.1 | BDL | BDL | ND | BDL | BDL | BDL ³ | BDL | BDL | 14 | ND | ND | BDL |
| Chlorobenzene | 2600 | 2300 | 2600 | 1500 | 54 | 48 | 55 | 39 | 15 | 140 | 510 | 650 | 75 | 61 | 82 | 62 ² | 1200 | 4900 | 7000 | 3600 ⁴ |
| Chloroform | ND | ND | ND | ND | BDL | BDL | BDL | ND | BDL | ND | ND | ND | ND | ND | ND | ND | 18 | ND | ND | ND |
| Ethylbenzene | ND | ND | ND | ND | 8 | BDL | BDL | ND | ND | ND | ND | ND | BDL | BDL | ND | BDL | 5 | ND | ND | BDL |
| Toluene | ND | ND | ND | ND | 16 | BDL | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | 6 | ND | ND | BDL |
| Xylenes (total) | ND | ND | ND | ND | 6 | BDL | BDL | BDL | BDL | ND | ND | ND | ND | BDL | BDL | ND | 9 | ND | ND | BDL |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Samples 3d (GW-1) and 10d (GW-3) were incorrectly labeled by the laboratory as samples 3s and 10s, respectively.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

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Table M-2.3

Summary of Analytical Results of Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3s | | | | 6s | | | | 10s | | | | 11s | | | |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 290 | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ND | BDL | ND | ND | ND | ND | BDL | BDL | ND | ND | ND | ND | ND | ND | ND | ND |
| Naphthalene | ND | BDL | ND | ND | ND | 28 | 66 | BDL | ND | ND | ND | ND | BDL | ND | ND | BDL |
| Dimethyl phthalate | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | ND | ND | ND | ND | BDL | BDL | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND | BDL |
| Acenaphthene | ND | ND | ND | ND | BDL | 25 | 24 | BDL | ND | BDL | BDL | ND | ND | BDL | BDL | BDL |
| 2-Methylnaphthalene | ND | ND | ND | ND | ND | BDL | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND |
| Fluoranthene | ND | ND | ND | ND | BDL | BDL | BDL | BDL | BDL | ND | ND | ND | ND | ND | ND | ND |
| Fluorene | ND | ND | ND | ND | 10 | 21 | 22 | BDL | ND | BDL | BDL | ND | BDL | ND | ND | BDL |
| Phenanthrene | ND | ND | ND | ND | BDL | BDL | BDL | ND | 16 | BDL | BDL | ND | BDL | ND | ND | BDL |
| Pyrene | ND | ND | ND | ND | BDL | BDL | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND |

| | 13s | | | | 14s | | | | 15s | | | | 16s | | | |
|---------------------|------|------|------|------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | 27 ¹ | BDL | ND | 13 | ND | ND | ND | ND | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 10 | 38 | 28 | 20 | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 14 | 46 | 32 | 18 | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 17 | 73 | 44 | 28 | ND | ND | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | BDL | BDL | BDL | 51 | 410 | 380 | 250 ⁴ | ND | ND | ND | ND |
| Dimethyl phthalate | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | ND | ND | BDL | BDL | BDL | BDL | BDL | BDL | 16 | BDL | 20 | 11 | BDL | BDL | BDL | ND |
| Acenaphthene | BDL | 22 | 27 | 22 | 12 | 10 | BDL | BDL | 25 | 31 | 33 | 19 | BDL | BDL | BDL | 24 |
| 2-Methylnaphthalene | ND | BDL | BDL | BDL | ND | ND | ND | BDL | BDL | 29 | 28 | 17 | BDL | 25 | BDL | ND |
| Fluoranthene | ND | BDL | ND | BDL | ND | BDL | BDL | BDL | 19 | 11 | BDL | BDL | BDL | BDL | BDL | ND |
| Fluorene | ND | ND | ND | ND | BDL | BDL | BDL | BDL | 21 | 24 | 24 | 14 | BDL | BDL | ND | ND |
| Phenanthrene | BDL | BDL | BDL | BDL | BDL | ND | 12 | BDL | 34 | 32 | 26 | 14 | BDL | 24 | BDL | ND |
| Pyrene | ND | ND | ND | ND | ND | ND | ND | BDL | 17 | 10 | BDL | BDL | BDL | ND | BDL | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

⁴Sample was diluted to bring the concentration into calibration range.

Sample 3s (GW-1) was incorrectly labeled by the laboratory as sample 3d.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Table M-2.4.

Summary of Analytical Results of Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 7d | | | | 8d | | | | 9d | | | | 10d | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | ND | ND | ND |
| 2-Methylphenol | 87 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | 69 | 93 | 78 | 32 | ND | ND | ND | ND | ND | ND | ND | ND | BDL | BDL | 10 | BDL | ND | ND | 10 | ND |
| 1,3-Dichlorobenzene | BDL | BDL | 25 | 21 | BDL | BDL | 13 | BDL | 43 | 76 | 130 | BDL | ND | BDL | ND | ND | BDL | BDL | BDL | BDL |
| 1,4-Dichlorobenzene | 290 | 360 | 470 | 390 | 99 | 120 | 130 | 150 | 380 | 750 | 740 | 290 | ND | ND | ND | ND | 170 | 210 | 270 | 250 |
| 1,2-Dichlorobenzene | ND | 100 | 120 | 83 | ND | BDL | BDL | ND | 410 | 890 | 830 | 300 | ND | BDL | ND | BDL | ND | 49 | 56 | 46 |
| Naphthalene | 470 | 510 | 490 | 380 | 98 | 57 | 44 | 59 | BDL | BDL | 26 | ND | BDL | BDL | 16 | BDL | 33 | 41 | 52 | 28 |
| 2-Methylnaphthalene | BDL | BDL | BDL | 10 | BDL | BDL | BDL | ND | BDL | ND | BDL | ND | BDL | BDL | 23 | 18 | BDL | BDL | BDL | ND |
| Dibenzofuran | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | BDL | BDL | BDL | BDL | ND | ND | ND | BDL |
| Acenaphthene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | ND | BDL | BDL | ND | BDL | ND | 25 | 22 | 12 ^a | 20 | BDL | 30 |
| 1,2,4 Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| | 11d | | | | 12d | | | | 14d | | | | 15d | | | |
|------------------------|-----------------|------|------|-----------------|------------------|------|------|------|-----------------|------|------|-----------------|------|------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | 14 | ND | 15 ^c |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 25 | ND | 30 ^c |
| 2,4-Dimethylphenol | ND | ND | ND | ND | ND | ND | BDL | BDL | 23 | 33 | 11 | BDL | BDL | 140 | 96 | 92 ^c |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | 11 | BDL | BDL | BDL | BDL | 46 | 45 | 37 |
| 1,4-Dichlorobenzene | 38 | 37 | 41 | 30 | ND | ND | ND | ND | 74 | BDL | BDL | 55 ^c | 63 | 640 | 650 | 570 ^d |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | BDL | BDL | BDL | BDL | 13 | 98 | 100 | 77 |
| Naphthalene | BDL | BDL | 29 | BDL | BDL | BDL | BDL | ND | 67 | 93 | 49 | 49 ^c | BDL | 630 | 470 | 630 ^d |
| 2-Methylnaphthalene | BDL | 37 | ND | 26 ^c | BDL | ND | BDL | BDL | BDL | 10 | BDL | BDL | 76 | 49 | BDL | 41 |
| Dibenzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | BDL | ND | BDL | ND | BDL |
| Acenaphthene | 17 ^b | 19 | 17 | 15 ^c | BDL ^b | BDL | 11 | BDL | 18 ^b | 18 | 15 | 17 ^c | ND | 22 | BDL | 18 |
| 1,2,4 Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

^aThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

^cSample was diluted to bring concentration into calibration range.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Samples 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

Table M-2.5. Summary of Analytical Results of PCBs in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 5s | | | | 6s | | | | 7s | | | | 9S | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | ND | ND | ND | ND | 7.5 | 1.5 | 0.7 | ND | 0.3 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | ND | ND | ND | 0.46 | ND | ND | ND | ND | ND | ND | ND | 0.54 | ND | ND | ND | ND |
| Aroclor 1260 | 0.5 | 1.3 | 6.7 | ND | 1.5 | ND | ND | ND | 3.2 | 2.5 | 10 | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | 0.46 | ND | ND | ND | .7 | ND | ND | ND | ND | ND | ND | ND | 3.6 |
| Total PCBs | 0.5 | 1.3 | 6.7 | 0.92 | 9 | 1.5 | 0.7 | .7 | 3.5 | 2.5 | 10 | 0.54 | ND | ND | ND | 3.6 |

| | 11s | | | | 13s | | | | 15s | | | | 16s | | | |
|--------------|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | 0.6 ¹ | ND | 3 | ND | 0.2 ¹ | ND | ND | ND | ND | 0.8 | ND | ND | 0.1 ¹ | 0.4 | ND | ND |
| Aroclor 1242 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1260 | 0.2 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PCBs | 0.8 ¹ | ND | 3 | ND | 0.2 ¹ | ND | ND | ND | ND | 0.8 | ND | ND | 0.1 ¹ | 0.4 | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

Table M-2.6. Summary of Analytical Results of PCBs in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6d | | | | 7d | | | | 9d | | | | 10d | | | | 11d | | | | 13d | | | |
|--------------|------------------|------------------|------|------|------------------|------|------|------|------|------|------|------|------------------|------------------|------|------|------------------|------|------|------|------------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | 0.1 [†] | 0.2 [†] | ND | ND | 0.2 [†] | ND | ND | ND | 1.5 | 1.8 | 2.5 | 2.1 | ND | 0.5 [†] | ND | ND | 0.2 [†] | ND | ND | ND | 0.1 [†] | ND | ND | ND |
| Aroclor 1260 | 0.4 [†] | ND | ND | ND | 0.1 [†] | ND | ND | ND | ND | ND | ND | ND | 0.1 [†] | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | ND | ND | ND | ND | 0.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PCBS | 0.5 [†] | 0.2 [†] | ND | ND | 0.3 [†] | ND | ND | 0.2 | 1.5 | 1.8 | 2.5 | 2.1 | 0.1 [†] | 0.5 [†] | ND | ND | 0.2 [†] | ND | ND | ND | 0.1 [†] | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

BDL = Below detection level.

ND = Not detected.

[†]The result is estimated below the detection level.

[‡]Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

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Table M-2.7. Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | 3s | | | 4s | | | 5s | | | 6s | | | 7s | | | 8s | | |
|----------------|--------|----------------|--------|------|-------|------|------|------|-------|------|------|------|------|--------|--------|------|-------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 2 | 3 | 4 | ND | 0.2 | 0.2 | ND | 0.6 | 0.3 | 9 | 3 | 3 | 6 | 4 | 1 | 0.4 | 0.2 | 1 | 2 | 2 | 3 |
| Arsenic | 0.03 | ND | ND | ND | 10 | 0.04 | 0.02 | 0.02 | 0.01 | 0.03 | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 | 0.04 | 0.05 | 0.04 | ND | ND | ND |
| Barium | 0.04 | 0.03 | 0.05 | 0.03 | ND | ND | ND | ND | ND | 0.2 | 0.1 | 0.1 | 0.1 | 0.06 | 0.03 | ND | ND | ND | ND | ND | 0.02 |
| Calcium | 33 | 23 | 20 | 26 | 33 | 25 | 44 | 38 | 46 | 56 | 45 | 52 | 113 | 42 | 45 | 21 | 22 | 23 | 37 | 49 | 54 |
| Chromium | 0.07 | 0.1 | 0.04 | ND | ND | ND | ND | ND | ND | 0.02 | 0.05 | ND | 0.05 | 0.04 | 0.01 | ND | ND | ND | 0.02 | 0.03 | 0.03 |
| Copper | ND | 0.02 | 0.03 | ND | ND | ND | ND | ND | ND | 0.08 | 0.03 | 0.03 | 0.04 | 0.04 | 0.02 | ND | ND | ND | 0.01 | 0.01 | ND |
| Iron | 6 | 6 ^a | 13 | 6 | 16 | 11 | 12 | 12 | 11 | 67 | 40 | 44 | 14 | 43 | 41 | 19 | 18 | 19 | 9 | 8 | 19 |
| Lead | ND | 0.02 | 0.03 | ND | 0.005 | ND | ND | 0.02 | 0.009 | 0.2 | 0.04 | 0.04 | 0.05 | 0.05 | 0.02 | ND | ND | 0.02 | ND | 0.02 | 0.04 |
| Magnesium | 9 | 9 | 11 | 6 | 7 | 5.6 | 7 | 6 | 8 | 8 | 6 | 7 | 31 | 12 | 13 | 3 | 3 | 3 | 32 | 44 | 51 |
| Manganese | 0.2 | 0.1 | 0.2 | 0.4 | 0.6 | 0.4 | 0.2 | 0.2 | 0.2 | 0.9 | 0.7 | 0.8 | 0.4 | 0.8 | 0.8 | 0.5 | 0.5 | 0.5 | 0.7 | 0.9 | 1.2 |
| Mercury | 0.0002 | ND | 0.0003 | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0001 | 0.0003 | ND | 0.001 | ND | ND | ND | ND |
| Potassium | 327 | 348 | 409 | 31 | 52 | 35 | 16 | 17 | 16 | 16 | 18 | 18 | 25 | 14 | 12 | ND | ND | ND | 172 | 211 | 207 |
| Sodium | 1810 | 1940 | 1390 | 11 | 21 | 15 | 20 | 19 | 18 | 38 | 36 | 39 | 474 | 12 | 13.4 | 7 | 8 | 6 | 170 | 232 | 255 |
| Vanadium | 0.07 | 0.1 | 0.09 | ND | ND | ND | ND | ND | ND | 0.03 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 | ND | ND | ND | 0.01 | 0.02 | 0.02 |
| Zinc | 0.03 | 0.05 | 0.05 | ND | 0.03 | ND | 0.02 | 0.03 | ND | 0.02 | 0.07 | 0.09 | 0.09 | 0.09 | 0.04 | 0.2 | 0.05 | ND | 0.05 | 0.04 | 0.06 |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^aThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130110

Table M-2.7.

Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 9a | | | 10a | | | 11a | | | 12a | | | 13a | | | 14a | | | 15a | | | 16a | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-----------------|-------|------|-------|------|------|---------|-------|------|------|------|-------|---------|--------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 0.4 | 0.9 | 2 | 0.3 | 1.5 | 0.4 | 0.5 | 0.8 | 5.7 | .4 | 0.3 | 0.2 | 0.9 | 3 | 1 | 2 | 5 | 1.8 | 4 | 5 | 4 | 3 | 2 | ND |
| Arsenic | ND | 0.02 | 0.04 | 0.02 | 0.02 | 0.01 | ND | ND | .006 | .02 | 0.007 | 0.008 | 0.03 | 0.03 | 0.01 | ND | 0.03 | 0.02 | 0.15 | ND | 0.11 | 0.03 | 0.02 | 0.02 |
| Barium | ND | ND | 0.02 | ND | ND | ND | 0.02 | ND | .03 | .04 | 0.03 | 0.04 | 0.01 | 0.03 | 0.03 | ND | 0.02 | ND | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | ND |
| Calcium | 44 | 37 | 33 | 36 | 35 | 44 | 71 | 20 | 36 | 94 | 84 | 111 | 43 | 39 | 42 | 11 | 13 | 14 | 25 | 36 | 35 | 57 | 60 | ND |
| Chromium | ND | 0.01 | ND | ND | ND | ND | ND | ND | .015 | ND | ND | ND | ND | 0.01 | ND | 0.02 | 0.02 | 0.01 | 0.03 | 0.03 | 0.02 | 0.02 | 0.01 | ND |
| Copper | ND | ND | ND | ND | 0.01 | ND | ND | ND | .022 | ND | ND | ND | ND | ND | ND | 0.01 | 0.02 | ND | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | ND |
| Iron | 6 | 8 | 8 | 9 | 12 | 10 | 30 | 10 | 24 | 33 | 27 ^b | 38 | 35 | 38 | 41 | 5 | 12 | 5.2 | 69 | 124 | 99 | 35 | 33 | ND |
| Lead | ND | 0.03 | 0.04 | ND | 0.01 | 0.01 | ND | 0.02 | ND | ND | ND | ND | ND | 0.007 | ND | ND | 0.02 | 0.008 | ND | ND | 0.01 | ND | 0.03 | 0.05 |
| Magnesium | 10 | 9 | 8 | 6 | 6 | 8 | 3 | 1 | 3 | 4 | 3 | 3.6 | 6 | 6 | 5 | 2 | 3 | 2.5 | 13 | 16 | 14 | 9 | 10 | ND |
| Manganese | 0.2 | 0.1 | 0.1 | 0.3 | 0.3 | 0.3 | 0.8 | 0.2 | 0.5 | 1.5 | 0.9 | 1 | 1 | 1 | 1 | 0.08 | 0.2 | 0.008 | 0.5 | 0.7 | 0.6 | 1.5 | 2 | ND |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00002 | ND | ND | ND | ND | .0009 | 0.00005 | 0.0006 |
| Potassium | 97 | 120 | 106 | 27 | 25 | 21 | 27 | 30 | 20 | 49 | 68 | 66 | 10 | 13 | 10 | 157 | 154 | 124 | 81 | 151 | 155 | 11 | 16 | ND |
| Sodium | 112 | 122 | 107 | 13 | 13 | 14 | 7 | 9 | 9 | 47 | 13 | 12.5 | 14 | 19 | 15 | 116 | 146 | 115 | 66 | 88 | 95 | 15 | 22 | ND |
| Vanadium | 0.03 | 0.02 | ND | ND | ND | ND | ND | ND | 0.03 | ND | ND | ND | .01 | 0.03 | 0.02 | 0.02 | 0.03 | 0.01 | 0.02 | 0.03 | 0.03 | 0 | 0.03 | 0.02 |
| Zinc | 0.02 | 0.03 | 0.03 | 0.03 | 0.02 | 0.2 | 0.02 | 0.02 | 0.07 | .02 | 0.02 | 0.03 | .02 | 0.02 | 0.02 | 0.03 | 0.05 | 0.02 | 0.07 | 0.09 | 0.08 | 0.08 | 0.04 | ND |
| Cyanide, Total | ND | ND | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^bThe result is estimated below the detection level.

^cCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130111

Table M-2.8. Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | 6d | | | 7d | | | 8d | | | 9d | | | 10d | | | 11d | | |
|----------------|------|------|------|-------|----------------|------|------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|-------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 1 | 1 | 0.7 | 2 | 4.5 | 1 | 5 | 3 | 0.5 | 1 | 1 | 0.5 | 1 | 6 | 1.8 | 2 | 9 | 1 | 7 | 2 | 3.2 |
| Antimony | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.02 | 0.06 | ND | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Barium | ND | ND | ND | 0.025 | 0.03 | 0.02 | 0.2 | 0.02 | 0.014 | ND | ND | ND | ND | 0.04 | 0.02 | 0.02 | 0.04 | ND | 0.03 | 0.01 | 0.02 |
| Cadmium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.05 | ND | ND | ND | ND | ND | ND | ND |
| Calcium | 105 | 105 | 103 | 68 | 61 | 49 | 73 | 55 | 57 | 119 | 137 | 144 | 178 | 182 | 115 | 161 | 134 | 92 | 150 | 111 | 113 |
| Chromium | 0.04 | 0.05 | 0.04 | 0.03 | 0.03 | 0.02 | 0.04 | 0.04 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.04 | 0.03 | 0.02 | 0.04 | 0.01 | 0.03 | 0.02 | 0.02 |
| Copper | ND | 0.01 | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 | ND | 2 | 0.03 | ND | 0.01 | ND | ND |
| Iron | 26 | 30 | 28 | 3 | 6 ^a | 2.5 | 12 | 12 ^a | 14 | 13 | 19 | 17 | 2 | 9 | 3 | 99 | 1113 | 4 | 13 | 5 | 9 |
| Lead | ND | ND | ND | ND | 0.009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.07 | 0.03 | ND | ND | ND | ND |
| Magnesium | 327 | 356 | 361 | 40 | 47 | 49 | 99 | 188 | 108 | 186 | 233 | 238 | 165 | 177 | 149 | 114 | 140 | 151 | 195 | 217 | 235 |
| Manganese | 0.6 | 0.7 | 0.7 | 0.09 | 0.1 | 0.1 | 0.3 | 0.3 | 0.3 | 0.7 | 0.8 | 0.7 | 0.1 | 0.3 | 0.2 | ND | 0.2 | 0.2 | 0.4 | 0.4 | 0.5 |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .0009 | ND |
| Potassium | 190 | 185 | 157 | 40 | 41 | 36 | 56 | 55 | 50 | 138 | 131 | 132 | 115 | 108 | 100 | ND | 114 | 112 | 198 | 195 | 153 |
| Silver | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | 1210 | 1300 | 1390 | 700 | 790 | 720 | 1000 | 1090 | 1160 | 867 | 799 | 847 | 1070 | 1070 | 944 | 787 | 845 | 743 | 1030 | 1080 | 1050 |
| Vanadium | ND | 0.01 | 0.02 | 0.07 | 0.06 | 0.05 | 0.06 | 0.06 | 0.05 | 0.02 | 0.01 | 0.01 | 0.04 | 0.07 | 0.08 | 0.03 | 0.05 | 0.03 | 0.02 | 0.02 | 0.3 |
| Zinc | ND | ND | ND | 0.02 | 0.03 | ND | 0.03 | 0.01 | 0.02 | 0.04 | 0.07 | ND | 0.02 | 0.04 | ND | 0.01 | 0.05 | 0.02 | 0.03 | ND | ND |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^aThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130112

Table M-2.8. Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 12d | | | 13d | | | 14d | | | 15d | | |
|----------------|------|------|-------|------|------|------|------|-----------------|------|------|-----------------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 0.8 | 2 | 4 | 8 | 6 | 9 | 6 | 9 | 3 | 4 | 2 | 4 |
| Antimony | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | 0.1 | ND | ND |
| Barium | 0.01 | 0.01 | 0.02 | 0.05 | 0.01 | 0.07 | ND | 0.04 | ND | 0.02 | 0.02 | 0.02 |
| Cadmium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Calcium | 184 | 111 | 119 | 68 | 134 | 69 | 94 | 89 | 100 | 79 | 141 | 123 |
| Chromium | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | 0.04 | 0.05 | 0.04 | 0.03 | 0.03 | 0.05 | 0.05 |
| Copper | ND | ND | ND | 0.01 | 0.02 | 0.02 | ND | 0.01 | ND | 0.02 | ND | ND |
| Iron | 3 | 7 | 12.5 | 15 | 10 | 18 | 7 | 11 | 5.6 | 16 | 29 | 28 |
| Lead | ND | ND | 0.006 | ND | ND | 0.02 | ND | ND | ND | ND | ND | ND |
| Magnesium | 199 | 269 | 287 | 90 | 128 | 133 | 208 | 210 | 211 | 146 | 318 | 328 |
| Manganese | 0.1 | 0.3 | 0.4 | 0.5 | 0.3 | 0.5 | 0.6 | 0.6 | 0.55 | 0.6 | 0.9 | 0.8 |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Potassium | 157 | 179 | 181 | 73 | 88 | 87 | 278 | 26 ¹ | 250 | 93 | 16 ¹ | 153 |
| Silver | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | 1020 | 1140 | 1180 | 799 | 1320 | 1420 | 1120 | 1080 | 1140 | 563 | 1270 | 1280 |
| Vanadium | 0.03 | 0.03 | 0.05 | 0.2 | 0.1 | 0.1 | 0.04 | 0.05 | 0.04 | 0.02 | 0.02 | 0.03 |
| Zinc | 0.02 | 0.02 | 0.05 | 0.06 | 0.04 | 0.06 | 0.03 | 0.05 | 0.03 | 0.06 | 0.02 | 0.02 |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130113

Table M-2.9. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1a | | | | 3a | | | | 4a | | | | 5a | | | |
|---------------------------------------|-------|------|------|------|-----------------|------|------|------|-----------------|-----------------|------------------|-----------------|------------------|------------------|-----------------|------------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | 11 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 6 ¹ | ND | ND | ND | 73 ¹ | ND | ND | 94 ¹ |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120 ¹ | ND | ND | ND | 72 ¹ | ND |
| C-9 C-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 ¹ | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 ¹ |
| 1-methyl Ethyl benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 28 ¹ | ND | ND | ND | 93 ¹ | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | ND | ND | ND | ND | ND | ND | ND | 38 ¹ | ND | ND | ND | 19 ¹ | 16 ¹ | ND | 6 ¹ |
| Total Volatile TICs | ND | ND | ND | ND | 11 ¹ | ND | ND | ND | 44 ¹ | 28 ¹ | 120 ¹ | 11 ¹ | 104 ¹ | 109 ¹ | 72 ¹ | 123 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram (µg/kg) or parts per billion (ppb).

Samples 3a (GW-1) and 10a (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table M-2.9. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6s | | | | 7s | | | | 8s | | | | 9s | | | |
|---------------------------------------|-----------|--------------|-----------|------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|-------------|------------|------------|-------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | 11' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | ND | ND | ND | ND | 7' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | 8' | ND | ND | 140' | ND | ND | 130' | ND | ND | ND | ND | 85' | 26' | ND | 130' |
| C-4 Benzene | ND | ND | ND | ND | 5' | ND | ND | 8' | ND | ND | ND | ND | 86' | 11' | ND | 49' |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7' | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9' |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 230' | ND | ND | ND | ND | ND | ND | ND | 43' | ND |
| C-10 H-8 Isomer | ND | ND | ND | 12' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | 5' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12' |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethyl benzene | ND | ND | ND | ND | ND | 180 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | 24' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 21' | ND | ND | 7' |
| 1,1,2 trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | 7' | 10.3' | ND | ND | 46' | 11' | ND | 6' | ND | ND | ND | ND | 15' | ND | ND | 149' |
| Total Volatile TICs | 7' | 42.3' | ND | 12' | 196' | 198' | 230' | 144' | ND | ND | ND | ND | 214' | 37' | 43' | 356' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

*Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram ($\mu\text{g}/\text{kg}$) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table M-2.9. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 10s | | | | 11s | | | | 12s | | | | 13s | | | |
|---------------------------------------|-------|------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl) Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | 17' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5' | ND | ND |
| C-3 Benzene | 390' | ND | ND | 300' | 1700' | 1100' | ND | ND | 160' | ND | ND | ND | 74' | ND | ND | 110' |
| C-4 Benzene | 83' | ND | ND | 102' | 53' | 28' | ND | ND | 7' | ND | ND | 8' | 21' | ND | ND | 7' |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6' | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-9 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | ND | 71' | ND | ND | ND | 6' |
| C-9 Hydrocarbon Isomer | ND | ND | 630' | ND | 36' | ND | 2400' | ND | ND | ND | 390' | ND | ND | ND | 90' | ND |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8' | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18' | ND | ND | ND | ND |
| 1-methyl Ethyl benzene | ND | 430' | ND | ND | ND | ND | ND | ND | ND | 280' | ND | 300' | ND | 64' | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19' | ND | ND | ND | 5' | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 24' | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 5' | 153' | ND | 6' | 56' | 56' | ND | 50' | 10' | ND | ND | 29' | ND | ND | ND | ND |
| Total Volatile TICs | 478' | 600' | 630' | 422' | 1845' | 1184' | 2400' | 50' | 201' | 299' | 390' | 440' | 95' | 74' | 90' | 123' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

*Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram ($\mu\text{g}/\text{kg}$) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table M-2.9. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 14a | | | | 15a | | | | 16a | | | |
|---------------------------------------|-------------|-------------|-------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | 540' | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | 19' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | 11' | ND | ND | ND | ND | ND | ND | ND | 9' | ND | ND |
| C-3 Benzene | 100' | ND | ND | 58' | 8' | ND | ND | 19' | 7' | ND | ND | 29' |
| C-4 Benzene | 32' | ND | ND | 40' | ND | ND | ND | ND | 26' | ND | ND | 8' |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | 8' | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | 12' | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | 33' | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | 41' | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | 7' | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | ND | ND | ND | ND | 62' | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 35' | ND | ND | ND | 32' | 7' |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | 680' | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | 8' | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10' |
| 1-methyl Ethyl benzene | ND | 74' | ND | ND | ND | 35' | ND | ND | ND | 40' | ND | ND |
| 2,3 dihyro 1-H-Indene | ND | 7' | ND | ND | ND | 41' | ND | ND | ND | 1' | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | 22' | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | 50' | ND | 13' | 53' | ND | ND | 6' | 26' | 62 | 12' | 15' |
| Total Volatile TICs | 132' | 161' | 120' | 149' | 61' | 616' | 35' | 869' | 59' | 111' | 44' | 69' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

*Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram ($\mu\text{g}/\text{kg}$) or parts per billion (ppb).

Samples 3a (GW-1) and 10a (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table M-2.10 Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d ¹ | | | | 6d | | | | 7d | | | | 8d | | | |
|----------------------------|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------------|----------------------|-----------------------|-----------|-----------|----------------------|-----------|-----------|-----------------------|
| | GW-1 | GW-2* | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethylbenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 7 ¹ | ND | ND | ND | ND | ND | ND | 34 ¹ |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | ND | ND | ND | ND | ND | ND | ND | ND | 23 ¹ | ND | ND | 7 ¹ | ND | ND | ND |
| Total Volatile TICs | ND | ND | ND | ND | ND | ND | ND | 13¹ | 7¹ | 23¹ | ND | ND | 7¹ | ND | ND | 34¹ |

| | 9d | | | | 10d ¹ | | | | 11d | | | |
|----------------------------|-----------------------|------------------------|------------------------|------------------|------------------|-----------|-----------|-----------|------------------------|------------------------|-----------------------|-----------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4* | GW-1* | GW-2* | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethylbenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 49 ¹ | ND | ND |
| C-3 Benzene | 50 ¹ | 110 ¹ | ND | ND | ND | ND | ND | ND | 141 ¹ | 45 ¹ | ND | 34 ¹ |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | 13 ¹ | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | 158 ¹ | 190 ¹ | ND | ND | ND | ND | 8 ¹ | ND | 18 ¹ | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 30 ¹ | 9 ¹ | ND | ND | ND | ND | ND | ND | 9 ¹ | 13 ¹ | ND | ND |
| Total Volatile TICs | 80¹ | 119¹ | 158¹ | 190 | ND | ND | ND | ND | 170¹ | 120¹ | 18¹ | 34 |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

*Results for dichlorobenzenes and/or naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

¹ Samples 3d (GW-1) and 10d (GW-2) were identified incorrectly by the laboratory as samples 3s and 10s, respectively.

TICs = Tentatively Identified Compounds.

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Table M-2.10 Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 12d | | | | 13d | | | | 14d | | | | 15d | | | |
|---------------------------------------|-----------------|------|------|-------|-----------------|-----------------|-----------------|-----------------|-------|-----------------|------|------------------|------|-------|------|-------|
| | GW-1 | GW-2 | GW-3 | GW-4* | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4* | GW-1 | GW-2* | GW-3 | GW-4* |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 62 ¹ | ND | ND | ND | ND | ND | ND |
| 1-methyl ethyl Benzene | ND | ND | ND | ND | ND | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | 82 ¹ | ND | ND | 31 | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 46 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | 18 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethene | ND | ND | ND | ND | ND | ND | ND | 15 ¹ | ND | ND | ND | 120 ¹ | ND | ND | ND | ND |
| Unknowns | 38 ¹ | ND | ND | ND | 6 ¹ | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND |
| Total Volatile TICs | 56 ¹ | ND | ND | ND | 88 ¹ | 38 ¹ | 46 ¹ | 58 ¹ | ND | 70 ¹ | ND | 125 ¹ | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1991.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

*Results for dichlorobenzenes and/or naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

¹ Samples 3d (GW-1) and 10d (GW-2) were identified incorrectly by the laboratory as samples 3s and 10s, respectively.

TICs = Tentatively Identified Compounds.

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Table M-2.11. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | | 3s | | | | 4s | | | | 5s | | | |
|-----------------------------------|-----------|-----------------|------------|-----------|--------------|-------------|-------------|-------------|-------------|-----------------|-------------|------------|-------------|--------------|--------------|-------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 28' | 37' | ND | 56' |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | 8' | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | 29' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | 15' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | 213' | ND | ND | 2600' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 105' | 110' | 189' | ND | 190' | 210' | 150' | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 24' | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18' | ND | ND | 350' | 450' | ND | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| nonyl Phenols | 7' | ND | ND | ND | ND | 51' | 54' | 38' | ND | ND | ND | ND | ND | ND | ND | 7' |
| substituted Phenol | ND | ND | ND | ND | ND | 83' | ND | 17' | ND | ND | 24' | 21' | ND | 31' | 404' | 90' |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | 39 ^m | 58' | ND | 13' | 61' | ND | ND | ND | 59 ^m | 29' | ND | 34' | ND | 66' | ND |
| Unknown Acid Ester | ND | ND | ND | ND | 27' | ND | 58' | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | ND | 226' | ND | ND | 574' | 409' | 357' | 444' | 48' | 40' | ND | ND | 298' | 333' | 407' | 538' |
| Total Semivolatile TICs | 7' | 493' | 58' | ND | 3214' | 633' | 469' | 507' | 153' | 227' | 266' | 21' | 900' | 1061' | 1027' | 690' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

^mThe result is estimated below the detection level.

^aCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

Table M-2.11. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6a | | | | 7a | | | | 8a | | | |
|-----------------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | 10 ¹ | 84 ¹ | 69 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | 50 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | 35 ¹ | 20 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 33 ¹ | 15 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | 22 ¹ | ND | ND | ND | ND | ND |
| 2,3 dihydro Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 78 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | 16 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | 330 ¹ | 430 ¹ | 140 ¹ | 10 ¹ | ND | ND | ND | ND | ND | 7 ¹ | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenol isomer | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| nonyl Phenols | 22 ¹ | 27 ¹ | ND | ND | 16 ¹ | 71 ¹ | ND | 41 ¹ | ND | ND | ND | ND |
| substituted Phenol | 19 ¹ | 17 ¹ | 110 ¹ | ND | ND | 248 ¹ | 158 ¹ | 195 ¹ | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 138 ¹ | 26 ² | 43 ¹ | ND | ND | 14 ¹ | 29 ¹ | ND | 10 ¹ | 23 ² | ND | ND |
| Unknown | 98 ¹ | 784 ¹ | 385 ¹ | 32 ¹ | 717 ¹ | 421 ¹ | 412 ¹ | 425 ¹ | 30 ¹ | 31 ¹ | 6 ¹ | ND |
| Total Semivolatile TICs | 388¹ | 1234¹ | 988¹ | 232¹ | 769¹ | 838¹ | 690¹ | 661¹ | 40¹ | 54¹ | 13¹ | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table M-2.11. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 9a | | | | 10a | | | | 11a | | | | 12a | | | |
|-----------------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | 22 ¹ | 14 ¹ | 42 ¹ | ND | 15 ¹ | 280 ¹ | 42 ¹ | 59 ¹ | ND | ND | ND | ND | ND | 130 ¹ | 94 ¹ | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 210 ¹ |
| C-4 Benzene | ND | ND | ND | 110 ¹ | ND | ND | ND | 24 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | 21 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiopene | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 ¹ |
| 2-(1,1-dimethylethyl) Phenol | 450 ¹ | ND | ND | ND | 30 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 120 ¹ | ND | ND | ND | 1500 ¹ | 2100 ¹ | ND | ND | 210 ¹ | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | 740 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | 18 ¹ | ND | ND | ND | ND | ND | 26 ¹ | ND | 72 ¹ | ND | ND | ND | ND |
| C-4 Phenol | 90 ¹ | 330 ¹ | 360 ¹ | 246 ¹ | ND | 260 ¹ | ND | ND | 261 ¹ | 1200 ¹ | 680 ¹ | 350 ¹ | ND | 1300 ¹ | 1400 ¹ | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 ¹ |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19 ¹ | 1124 ¹ | ND | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | ND | ND | 24 ¹ | ND | 208 ¹ | 181 ¹ | 36 ¹ | ND | ND | 36 ¹ |
| substituted Phenol | ND | ND | 89 ¹ | 83 ¹ | ND | 350 ¹ | 1447 ¹ | 2320 ¹ | ND | ND | ND | ND | ND | 558 ¹ | ND | 75 ¹ |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 203 ¹ | 80 ¹ | ND | ND | 27 ¹ | ND | ND | ND | 110 ¹ | 26 ¹ | ND | ND | 203 ¹ | ND | ND | 30 ¹ |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 529 ¹ | 637 ¹ | 365 ¹ | 91 ¹ | 1287 ¹ | 533 ¹ | 653 ¹ | 332 ¹ | 720 ¹ | 1003 ¹ | 736 ¹ | 362 ¹ | 1000 ¹ | ND | 400 ¹ | 558 ¹ |
| Total Semivolatile TICs | 1414¹ | 1061¹ | 869¹ | 579¹ | 2872¹ | 3523¹ | 2142¹ | 2735¹ | 2065¹ | 2255¹ | 1624¹ | 1207¹ | 2363¹ | 1988¹ | 1894¹ | 710¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table M-2.11. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 13c | | | | 14a | | | | 15a | | | | 16a | | | |
|-----------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--------------------------|-------------------------|-----------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | ND | 10 ¹ | ND | ND | 12 ¹ | 33 ¹ | ND | ND | ND | ND | 25 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | 20 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiopene | ND | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 37 ¹ | 1679 ¹ | 368 ¹ | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 17 ¹ | 20 ¹ | 11 ¹ | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 322 ¹ | 26 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | 15 ¹ | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 630 ¹ | 170 ¹ | 26 ¹ | ND | ND | ND | ND |
| 1-Methyl naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | 29 ¹ | 7 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | 77 ¹ | 60 ¹ | ND | 65 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 13 ¹ | 2200 ¹ | 390 ¹ | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | ND | ND | ND | 9 ¹ | ND | 2200 ¹ | ND | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | 45 ¹ | ND | ND | ND | ND | 58 ¹ | ND | ND | ND | ND | 650 ¹ | 910 ¹ | ND | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | 90 ¹ | ND | ND | ND | 15 ¹ | ND | ND | ND | ND | ND | ND | ND | 55 ¹ | ND | ND |
| nonyl Phenols | 43 ¹ | 54 ¹ | 27 ¹ | 9 ¹ | 26 ¹ | 14 ¹ | 16 ¹ | 71 ¹ | 7 ¹ | ND | ND | ND | 76 ¹ | 54 ¹ | 54 ¹ | ND |
| substituted Phenol | ND | 8 ¹ | 26 ¹ | 136 ¹ | 23 ¹ | ND | 151 ¹ | 68 ¹ | ND | ND | ND | ND | ND | 79 ¹ | 830 ¹ | 115 ¹ |
| methyl Quinoline isomer | ND | 33 ¹ | ND | ND | ND | 9 ¹ | ND | ND | ND | ND | 110 ¹ | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | 14 ¹ | 30 ¹ | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 14 ¹ | 31 ¹ | ND | 6 ¹ | 25 ¹ | 21 ¹ | ND | ND | ND | 28 ¹ | ND | ND | ND | ND | 56 ¹ | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | 457 ¹ | 332 ¹ | 311 ¹ | 276 ¹ | 102 ¹ | 288 ¹ | 248 ¹ | 229 ¹ | 111 ¹ | 4003 ¹ | 903 ¹ | 57 ¹ | 763 ¹ | 952 ¹ | 953 ¹ | 959 ¹ |
| Total Semivolatile TICs | 865¹ | 591¹ | 409¹ | 427¹ | 265¹ | 440¹ | 453¹ | 520¹ | 222¹ | 10790¹ | 1977¹ | 93¹ | 1489¹ | 2050¹ | 1893¹ | 1074¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/L) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

Table M-2.12 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 6d | | | | 7d | | | |
|-------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|-----------------|-----------------|-----------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | 47 [†] | ND | ND | 9 [†] | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | 47 [†] | 24 [†] | ND | 38 [†] | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 85 [†] | ND | 20 [†] | ND | 98 [†] | ND | ND | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | 1600 [†] | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 [†] |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4 Naphthalenedione | ND | 92 [†] | ND | 28 [†] | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | 36 [†] | 30 [†] | 9 [†] | ND | ND | ND | ND | 17 [†] | 26 [†] | 14 [†] | 24 [†] |
| C-4 Phenol | 103 [†] | ND | ND | ND | ND | 29 [†] | ND | ND | ND | ND | 4 [†] | ND |
| substituted Phenol | ND | ND | ND | 15 [†] | ND | 38 [†] | 40 [†] | ND | ND | 7 [†] | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | 4 [†] | ND | ND | ND | ND | ND |
| [4-(1 methyl-1-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | 78 [†] | ND | ND | 63 [†] | 48 [†] | 49 [†] | 8 [†] | ND | 14 [†] | 19 [†] | ND |
| Unknown | 153 [†] | 148 [†] | 120 [†] | 59 [†] | 400 [†] | 137 [†] | 40 [†] | 14 [†] | 43 [†] | 5 [†] | 14 [†] | 5 [†] |
| Total Semivolatile TICs | 435 [†] | 378 [†] | 170 [†] | 158 [†] | 561 [†] | 252 [†] | 133 [†] | 22 [†] | 1660 [†] | 52 [†] | 51 [†] | 38 [†] |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

[†]The result is estimated below the detection level.

[‡]Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3a.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table M-2.12 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 8d | | | | 9d | | | | 10d | | | |
|-----------------------------------------|------|-----------------|------------------|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | 62 ¹ | 96 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | 33 ¹ | ND | ND | ND | ND |
| Benzo (b) thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 20 ¹ | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | 35 ¹ | 73 ¹ | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | 23 ¹ | 4 ¹ | ND | ND | ND | 9 ¹ | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 66 ¹ | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 85 ¹ | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4 Naphthalenedione | ND | ND | 19 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | 6 ¹ | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 51 ¹ | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | 73 ¹ | ND | ND | ND | 180 ¹ | 230 ¹ | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | 29 ¹ | 31 ¹ | 55 ¹ | 29 ¹ | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | ND | ND | ND | 8 ¹ | 12 ¹ | ND | ND | 70 ¹ | ND | ND |
| substituted Phenol | ND | ND | ND | ND | ND | ND | 14 ¹ | 40 ¹ | ND | 77 ¹ | 338 ¹ | 81 ¹ |
| nonyl Phenols | ND | ND | ND | ND | 47 ¹ | ND | 20 ¹ | 11 ¹ | ND | ND | ND | ND |
| [4-(methyl-1-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 520 ¹ |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | 5 ¹ | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | 32 ¹ | 15 ¹ | ND | ND | ND | 23 ¹ | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | ND | 71 ¹ | ND | 56 ¹ | 47 ¹ | ND | ND | ND | 26 ¹ | ND | ND |
| Unknown | ND | ND | 16 ¹ | ND | 246 ¹ | 208 ¹ | 83 ¹ | 58 ¹ | 108 ¹ | 69 ¹ | 118 ¹ | 138 ¹ |
| Total Semivolatile TICs | ND | 23 ¹ | 110 ¹ | ND | 568 ¹ | 406 ¹ | 362 ¹ | 272 ¹ | 359 ¹ | 507 ¹ | 456 ¹ | 751 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/L) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table M-2.12 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 11d | | | | 12d | | | | 13d | | | |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | 12' | 14' | ND | ND | ND | ND | ND | ND | 24' | 19' | 6' |
| C-3 Benzene | ND | ND | ND | 43' | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | 10' | ND | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 11' | ND | 11' | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | 5' | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 41' | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | 6' | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | 6' | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 O Isomer | ND | ND | ND | 6' | ND | ND | ND | 16' | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | 6' | ND | ND | ND | ND | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | 27' | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | 8' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 28' | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | 18' | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | 39' | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4-Naphthalenedione | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 100' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | 73' | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | 6' | ND | ND | ND | ND | ND | ND | ND | 14' | ND |
| C-3 Phenol | 60' | ND | ND | 31' | 10' | 9' | 15' | 25' | ND | ND | ND | ND |
| C-4 Phenol | ND | 23' | ND | 6' | ND | 32' | 33' | ND | ND | ND | ND | ND |
| substituted Phenol | ND | 65' | 37' | ND | ND | 123' | 77' | 32' | ND | ND | ND | ND |
| nonyl Phenols | 40' | ND | ND | 6' | ND | ND | 14' | 33' | ND | ND | ND | ND |
| [4-(methyl-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | 41' | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 169' | 46' | 33' | ND | 213' | 91' | 7' | ND | ND | 18' | 11' | ND |
| Unknown | 552' | 202' | 59' | 57' | 481' | 243' | 192' | 62' | 59' | 87' | 9' | 8' |
| Total Semivolatile TICs | 763' | 395' | 199' | 199' | 823' | 508' | 338' | 209' | 100' | 129' | 53' | 14' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

^aThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table M-2.12 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 14d | | | | 15d | | | |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|--------------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | |
| C-x Benzene | ND | 6 ¹ | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | 10 ¹ | ND | ND | ND |
| substituted Benzene | ND | ND | ND | 6 ¹ | ND | 17 ¹ | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | 37 ¹ | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | 32 ¹ | ND | ND | ND |
| C-x H-x O Isomer | ND | 142 ¹ | ND | ND | 16 ¹ | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | 4 ¹ | ND | ND | ND | 53 ¹ |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | 63 ¹ |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | 336 ¹ |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | 6 ¹ |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 280 ¹ |
| 9 H Carazole | ND | ND | ND | 7 ¹ | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | 100 ¹ |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | 11 ¹ | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxy-1-1,4-Naphthalenedione | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | 6 ¹ | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | 17 ¹ | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | 5 ¹ | 11 ¹ | ND | ND | 45 ¹ | ND |
| C-3 Phenol | 51 ¹ | ND | ND | 73 ¹ | ND | 8 ¹ | 155 ¹ | 1027 ¹ |
| C-4 Phenol | ND | ND | 61 ¹ | ND | ND | ND | ND | ND |
| substituted Phenol | ND | ND | ND | 13 ¹ | ND | 17 ¹ | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | ND | ND |
| [4-(methyl-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | 15 ¹ | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | 11 ¹ |
| phenyl Pyridine isomer | ND | 5 ¹ | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | 7 ¹ | 54 ¹ | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | 17 ¹ | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | 17 ¹ | ND | ND | ND | ND | ND |
| Unknown Amide | 27 ¹ | 17 ¹ | ND | ND | ND | 17 ¹ | ND | ND |
| Unknowns | 41 ¹ | 117 ¹ | 17 ¹ | 71 ¹ | 1407 ¹ | 131 ¹ | 59 ¹ | 660 ¹ |
| Total Semivolatile TICs | 119¹ | 327¹ | 100¹ | 185¹ | 1491¹ | 271¹ | 374¹ | 2,552¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

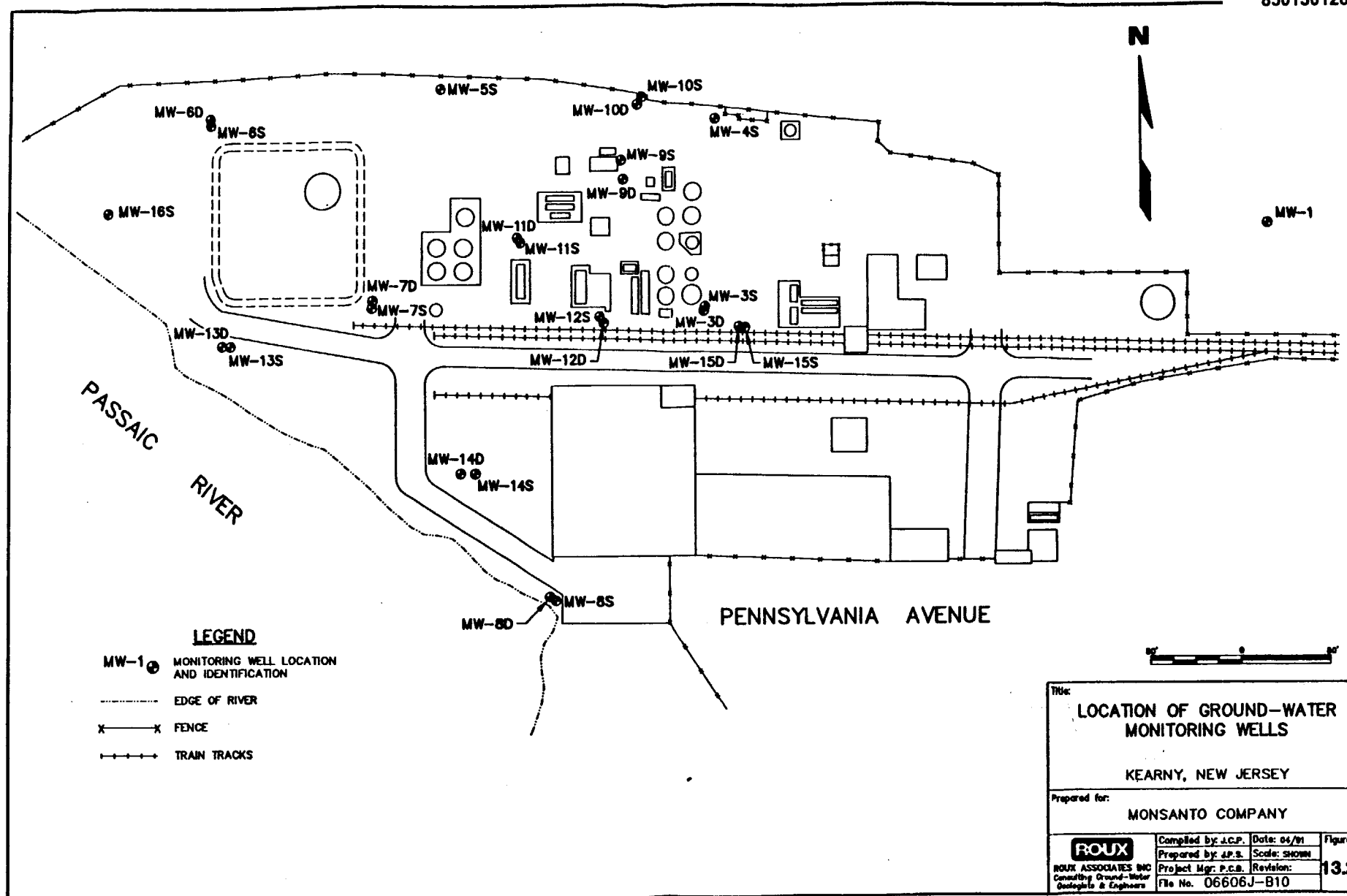
Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3a.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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ATTACHMENT 13-C

**Summary of Roux Associates, Inc. Remedial
Investigation Data for Subsurface Soil Samples
with Location Maps (Item 13)**

Table M-3.1. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | |
|--------------|-----------------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | TSP ⁽²⁾
1 | TSP ⁽²⁾
2 | TSP ⁽²⁾
3 | TSP ⁽²⁾
4 | TSP ⁽²⁾
5 |
| | <u>Volatile TCLs</u> | | | | | |
| 4 to 6 feet | Toluene (0.006) | ND | ND | ND | ND | 18 |
| | Ethylbenzene (0.05) | ND | ND | ND | ND | 6.2 |
| | total Xylenes (<0.67) | ND | ND | ND | ND | 1 |
| | Total Volatile TCLs | ND | ND | ND | ND | 25.2 |
| | <u>Volatile TCLs</u> | | | | | |
| 9 to 11 feet | Toluene (<0.67) | N/A | N/A | N/A | N/A | ND |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | N/A | 2 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | N/A | 0.5 J |
| | Total Volatile TCLs | N/A | N/A | N/A | N/A | 2.5 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

The analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

⁽²⁾Samples TSP-1, TSP-2, TSP-3 and TSP-4 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Sample TSP-5 was collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, xylenes (BTEX) only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table M-3.2. Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | |
|--------------|-------------------|-----------------------------------|----------|----------|----------|
| | | TSP
1 | TSP
2 | TSP
3 | TSP
4 |
| 4 to 6 feet | Semivolatile TCLs | ND | ND | ND | ND |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles.

There was no request for semivolatile analysis in the April 1991 sampling.

Table M-3.3. Summary of Analytical Results of PCBs for Soil Boring Samples Collected at the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | |
|--------------|--------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | TSP ⁽²⁾
1 | TSP ⁽²⁾
2 | TSP ⁽²⁾
3 | TSP ⁽²⁾
4 | TSP ⁽³⁾
5 |
| 4 to 6 feet | <u>PCBs</u> | | | | | |
| | Aroclor 1248 | 6 J | 0.8 J | 3 J | 1 J | 1.3 J |
| | Aroclor 1260 | 5 J | 0.4 J | 1 J | 2.5 J | 1.4 |
| | Total PCBs | 11 J | 1.1 J | 4 J | 3.5 J | 2.7 |
| 9 to 11 feet | <u>PCBs</u> | | | | | |
| | Aroclor 1248 | N/A | N/A | N/A | N/A | 1.2 J |
| | Aroclor 1260 | N/A | N/A | N/A | N/A | 0.9 J |
| | Total PCBs | N/A | N/A | N/A | N/A | 2.1 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels range between 0.5 and 11 mg/kg for Aroclor 1248 and 0.9 and 22 mg/kg for Aroclor 1260.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

⁽²⁾Samples TSP-1, TSP-2, and TSP-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples TSP-4, TSP-5, and TSP-6 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table M-3.4. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | | |
|--------------|----------------------|-----------------------------------|--------|--------|--------|
| | | TSP 1 | TSP 2 | TSP 3 | TSP 4 |
| 4 to 6 feet | Aluminum (29.8) | 2440 | 7790 | 3480 | 3150 |
| | Antimony (45.4) | 12.6 J | 14.1 J | 10.7 J | 10.6 J |
| | Arsenic (47.9) | 43.5 | 53.4 | 2.9 | 1.4 B |
| | Barium (0.7) | 17.5 B | 108 | 15.2 B | 12.3 B |
| | Beryllium (0.3) | 0.2 B | 0.5 B | 0.1 B | 0.1 J |
| | Cadmium (4.5) | 1.2 J | 2.9 J | 1.1 J | 1.1 J |
| | Calcium (25.8) | 2140 | 11700 | 890 B | 673 B |
| | Chromium (3.7) | 87.2 | 111 | 19.9 | 8.5 |
| | Cobalt (5.1) | 1.6 B | 7.1 B | 1.6 B | 1.6 B |
| | Copper (2.3) | 39.7 | 140 | 10.4 | 8.1 |
| | Iron (13.5) | 7100 | 24400 | 8530 | 6780 |
| | Lead (48.1) | 84.3 | 137 | 13.9 J | 11.2 J |
| | Magnesium (96.3) | 913 B | 5070 | 1460 | 1410 |
| | Manganese (0.8) | 74.0 | 621 | 334 | 65.9 |
| | Mercury (0.2) | 0.5 | 0.9 | 0.1 J | 0.1 J |
| | Nickel (24.2) | 11.5 | 37.9 | 9.4B | 10.5 |
| | Potassium (2048) | 1140 B | 2050 | 482 J | 479 J |
| | Selenium (74.4) | 0.7 B | 1.2 B | 0.5 J | 0.5 J |
| | Silver (3.2) | 0.9 J | 1.1 B | 0.8 J | 0.8 J |
| | Sodium (1814) | 503 J | 565 J | 427 J | 424 J |
| | Thallium (218) | 0.6 J | 0.6 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 15.4 | 107 | 14.2 | 10.4B |
| | Zinc (3.3) | 173 | 233 | 36 | 21 |
| | Cyanide, total (0.5) | ND | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each parameter.

⁽¹⁾ Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 and 6 feet below ground surface on May 8, 1990.

Samples which were collected on April 4 were not analyzed for inorganic parameters.

Table M-3.5. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | | |
|--------------|----------------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | SSP ⁽²⁾
1 | SSP ⁽²⁾
2 | SSP ⁽²⁾
3 | SSP ⁽³⁾
4 | SSP ⁽³⁾
5 | SSP ⁽³⁾
6 | SSP ⁽³⁾
7 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | | | | | |
| | Benzene (<0.67) | ND | ND | ND | ND | ND | 0.3 | N/A |
| | Toluene (0.006) | 58 | ND | ND | ND | 0.4 | 0.8 | N/A |
| | Ethylbenzene (0.005) | 2.3 J | ND | ND | 3.1 | 0.8 | 3.2 | N/A |
| | total Xylenes (<0.67) | ND | ND | ND | 0.8 | 0.2 | 2.2 | N/A |
| | Total Volatile TCLs | 60.3 | ND | ND | 3.9 | 1.4 | 6.5 | N/A |
| 9 to 11 feet | <u>Volatile TCLs</u> | | | | | | | |
| | Benzene (<0.67) | N/A | N/A | N/A | ND | 0.3 J | 0.2 J | 0.2 J |
| | Toluene (<0.67) | N/A | N/A | N/A | ND | ND | 0.4 J | 3.8 |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | ND | 1.8 | 2.7 | 0.8 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | 0.8 | 2.1 | 0.9 | 0.6 |
| | Total Volatile TCLs | N/A | N/A | N/A | 0.8 | 4.2 | 4.2 | 5.4 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

⁽²⁾Samples SSP-1, SSP-2, and SSP-3 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Samples SSP-4, SSP-5, SSP-6 and SSP-7 were collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, and total xylenes (BTEX), only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table M-3.6.

Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | |
|--------------------------|----------|-----------------------------------|----------|----------|
| | | SSP
1 | SSP
2 | SSP
3 |
| <u>Semivolatile TCLs</u> | | | | |
| 4 to 6 feet | Phenol | ND | 140 | 110 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles.

There was no request for semivolatile analysis in the April 1991 sampling.

Table M-3.7.

Summary of Analytical Results of PCBs for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | | |
|--------------|--------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | SSP ⁽²⁾
1 | SSP ⁽²⁾
2 | SSP ⁽²⁾
3 | SSP ⁽³⁾
4 | SSP ⁽³⁾
5 | SSP ⁽³⁾
6 | SSP ⁽³⁾
7 |
| 4 to 6 feet | <u>PCBs</u> | | | | | | | |
| | Aroclor 1248 | 280 | 25 | 29 | 3.3 | ND | 41 | N/A |
| | Aroclor 1260 | 43 | 23 | 49 | 17 | 200 | 14 J | N/A |
| | Total PCBs | 323 | 48 | 78 | 20.3 | 200 | 55 | N/A |
| 9 to 11 feet | <u>PCBs</u> | | | | | | | |
| | Aroclor 1248 | N/A | N/A | N/A | 0.6 J | 5.9 | 0.2 | 1.5 |
| | Aroclor 1260 | N/A | N/A | N/A | 6.7 | 75 | 0.5 | 5.3 |
| | Total PCBs | N/A | N/A | N/A | 7.3 | 80.9 | 0.7 | 6.8 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels range between 2 and 12 mg/kg for Aroclor 1248 and 20 to 24 mg/kg for Aroclor 1260.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

⁽²⁾Samples SSP-1, SSP-2, and SSP-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples SSP-4, SSP-5, SSP-6 and SSP-7 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table M-3.8. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | |
|--------------|----------------------|-----------------------------------|--------|--------|
| | | SSP 1 | SSP 2 | SSP 3 |
| 4 to 6 feet | Aluminum (29.8) | 3320 | 6310 | 13900 |
| | Antimony (45.4) | 11.2 J | 13.2 J | 13.6 J |
| | Arsenic (47.9) | 4.7 | 18.6 | 12.7 |
| | Barium (0.7) | 27.9 B | 70.4 | 137 |
| | Beryllium (0.3) | 0.2 B | 1.1 B | 2.5 |
| | Cadmium (4.5) | 1.1 J | 1.3 J | 1.3 J |
| | Calcium (25.8) | 26500 | 2120 | 28300 |
| | Chromium (3.7) | 108 | 28.4 | 21.5 |
| | Cobalt (5.1) | 2.7 B | 8.2 B | 7.9 |
| | Copper (2.3) | 32.8 | 67.2 | 91.4 |
| | Iron (13.5) | 8790 | 16300 | 25400 |
| | Lead (48.1) | 43.3 | 50.9 | 149 |
| | Magnesium (96.3) | 1800 | 954 B | 815 B |
| | Manganese (0.8) | 92.8 | 82 | 320 |
| | Mercury (0.2) | 0.4 | 0.3 | 0.2 |
| | Nickel (24.2) | 8.6 B | 25.4 | 28.1 |
| | Potassium (2048) | 504 J | 594 J | 1010 B |
| | Selenium (74.4) | 0.5 B | 1.7 | 1.4 B |
| | Silver (3.2) | 0.8 J | 1.0 J | 1.0 J |
| | Sodium (1814) | 447 J | 526 J | 542 J |
| | Thallium (218) | 0.5 J | 0.8 B | 0.6 J |
| | Vanadium (3.9) | 15.4 | 23.9 | 35 |
| | Zinc (3.3) | 337 | 160 | 55.9 |
| | Cyanide, total (0.5) | 2.0 | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each compound.

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 to 6 feet below ground surface on May 8, 1990.

Samples which were collected on April 4 were not analyzed for inorganic parameters.

⁽¹⁾ Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

Table M-3.9. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | |
|--------------|-----------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | APS ⁽²⁾
1 | APS ⁽²⁾
2 | APS ⁽²⁾
3 | APS ⁽³⁾
4 | APS ⁽³⁾
5 | APS ⁽³⁾
6 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | | | | |
| | Toluene (<0.67) | 2.5 | ND | ND | 17 | 2 | N/A |
| | Ethylbenzene (0.005) | ND | ND | ND | 2.8 | 1.7 | N/A |
| | total Xylenes (<0.67) | ND | ND | ND | 1.9 | 0.5J | N/A |
| | Total Volatile TCLs | 2.5 | ND | ND | 21.7 | 4.2 | N/A |
| 9 to 11 feet | <u>Volatile TCLs</u> | | | | | | |
| | Toluene (<0.67) | N/A | N/A | N/A | 2.9 | 0.9 | 8.4 |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | 0.5J | 0.1J | 1.1 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | 0.5J | 0.08 | 0.8 |
| | Total Volatile TCLs | N/A | N/A | N/A | 3.9 | 1.08 | 10.3 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

⁽¹⁾Sample identification in a combination of sample boring location and depth interval (e.g. APS 1 @ 4 to 6 feet is sample APS-146). Analytical detection levels are presented in parenthesis for each compound.

⁽²⁾Samples AP/SS-1, AP/SS-2, and AP/SS-3 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Samples AP/SS-4, AP/SS-5, and AP/SS-6 were collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, xylenes (BTEX) only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table M-3.10. Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | |
|--------------------------|----------|-----------------------------------|----------|----------|
| | | APS
1 | APS
2 | APS
3 |
| <u>Semivolatile TCLs</u> | | | | |
| 4 to 6 feet | Phenol | 56 J | 840 | ND |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles (EPA Method 625 with library search).

There was no request for semivolatile analysis in the April 1991 sampling.

Table M-3.11. Summary of Analytical Results of PCBs for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Indentification Number | | | | | |
|--------------|--------------------|------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | APS ⁽²⁾
1 | APS ⁽²⁾
2 | APS ⁽²⁾
3 | APS ⁽³⁾
4 | APS ⁽³⁾
5 | APS ⁽³⁾
6 |
| | <u>PCBs</u> | | | | | | |
| 4 to 6 feet | Aroclor 1248 | 220 | 630 | 4 | 5.7 | 83 | N/A |
| | Aroclor 1260 | 36 | 78 | 10 | 2.6 | 28 | N/A |
| | Total PCBs | 256 | 708 | 14 | 8.3 | 111 | N/A |
| | <u>PCBs</u> | | | | | | |
| 9 to 11 feet | Aroclor 1248 | N/A | N/A | N/A | 5.5 | 1.4 | 27 |
| | Aroclor 1260 | N/A | N/A | N/A | 2.8 | 0.5 | 2.6 |
| | Total PCBs | N/A | N/A | N/A | 8.3 | 1.9 | 29.6 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

⁽²⁾Samples AP/SS-1, AP/SS-2, and AP/SS-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples AP/SS-4, AP/SS-5, and AP/SS-6 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table M-3.12. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former AP/Sterox Sump. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | | |
|--------------|----------------------|-----------------------------------|--------|--------|--------|
| | | APS 1 | APS 2 | APS 3 | APS 3* |
| 4 to 6 feet | Aluminum (29.8) | 6450 | 5130 | 2630 | 3260 |
| | Antimony (45.4) | 13.4 J | 12.0 J | 10.4 J | 11.5 J |
| | Arsenic (47.9) | 11.5 J | 3.2 | 2.8 | 2.8 |
| | Barium (0.7) | 120.0 | 42.8 B | 17.1 B | 20.8 B |
| | Beryllium (0.3) | 1.9 | 1.7 | 0.1 B | 0.2 B |
| | Cadmium (4.5) | 1.3 J | 1.2 J | 1.0 J | 1.1 J |
| | Calcium (25.8) | 25500 | 5490 | 18300 | 8730 |
| | Chromium (3.7) | 68.0 | 40.1 | 5.9 | 7.2 |
| | Cobalt (5.1) | 15.0 | 10.5 B | 2.8 B | 4.6 B |
| | Copper (2.3) | 316 | 151 | 11.2 | 17.7 |
| | Iron (13.5) | 25400 | 18300 | 7500 | 10000 |
| | Lead (48.1) | 380 | 166 | 13.2 | 20.6 J |
| | Magnesium (96.3) | 3380 | 4590 | 130 | 1680 |
| | Manganese (0.8) | 606 | 276 | 130.0 | 132 |
| | Mercury (0.2) | 1.8 | 0.7 | 0.1 J | 0.1 J |
| | Nickel (24.2) | 154 | 60.8 | 7.8 B | 10.3 |
| | Potassium (2048) | 1220 B | 543 J | 470 J | 519 J |
| | Selenium (74.4) | 0.7 B | 0.6 B | 0.5 B | 0.5 J |
| | Silver (3.2) | 0.9 J | 0.9 B | 0.7 J | 0.8 B |
| | Sodium (1814) | 764 B | 481 J | 416 J | 459 J |
| | Thallium (218) | 0.6 J | 0.5 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 33.5 | 27.6 | 7.8 B | 22.3 |
| | Zinc (3.3) | 1470 | 591 | 65 | 79 |
| | Cyanide, total (0.5) | ND | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each parameter.

⁽¹⁾ Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

* Field duplicate sample.

Samples were collected between 4 and 6 feet below ground surface on May 14, 1990.

Samples collected on April 4 were not analyzed for inorganic parameters.

Table M-3.13. Summary of Analytical Results of Organic Compounds for Soil Boring Samples from the Former Acid Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | |
|--------------|---------------------------------|-----------------------------------|--------|--------|
| | | AS 1 | AS 2 | AS 3 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | |
| | Acetone (0.01) | 0.02 | ND | ND |
| | | | | |
| | <u>Semivolatile TCLs</u> | ND | ND | ND |
| | | | | |
| | <u>PCBs</u> | | | |
| | Aroclor 1248 (<0.1) | ND | 0.04 J | 0.01 J |
| | Aroclor 1260 (<0.2) | ND | 0.09 J | 0.03 J |
| | Total PCBs | ND | 0.13 | 0.04 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

The analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. ASP 1 @ 4 to 6 feet is sample AS-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples AS-1, AS-2, and AS-3 were collected in May 1990 and analyzed volatiles and semivolatiles and PCBs.

Table M-3.14. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Acid Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Depth | TAL Parameters | Sample Identification Number | | |
|-------------|----------------------|------------------------------|---------|---------|
| | | AS
1 | AS
2 | AS
3 |
| 4 to 6 feet | Aluminum (29.8) | 4650 | 183 | 203 |
| | Antimony (45.4) | 11.1 J | 11.5 J | 10.6 J |
| | Arsenic (47.9) | 5.6 | 4.9 | 0.8 B |
| | Barium (0.7) | 15.0 B | 2.2 B | 3.1 B |
| | Beryllium (0.3) | 0.2 J | 0.1 J | 0.1 J |
| | Cadmium (4.5) | 1.1 J | 1.1 J | 1.1 J |
| | Calcium (25.8) | 1390 | 100 B | 248 B |
| | Chromium (3.7) | 13.1 | 1.0 J | 0.9 J |
| | Cobalt (5.1) | 1.2 J | 1.3 J | 1.2 J |
| | Copper (2.3) | 11.8 | 7.0 | 2.6 B |
| | Iron (13.5) | 9820 | 307 | 216 |
| | Lead (48.1) | 11.4 J | 12.1 J | 11.2 J |
| | Magnesium (96.3) | 277 B | 66.2 B | 77.7 J |
| | Manganese (0.8) | 38.0 | 13.8 | 4.3 |
| | Mercury (0.2) | 0.1 J | 0.1 J | 0.1 J |
| | Nickel (24.2) | 5.9 J | 6.1 J | 5.7 J |
| | Potassium (2048) | 3370 | 517 J | 479 J |
| | Selenium (74.4) | 0.5 J | 0.5 J | 0.5 J |
| | Silver (3.2) | 0.8 J | 0.8 J | 0.8 J |
| | Sodium (1814) | 442 J | 458 J | 424 J |
| | Thallium (218) | 0.5 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 12.2 | 1.0 J | 0.9 J |
| | Zinc (3.3) | 65 | 4.1 B | 4.2 B |
| | Cyanide, total (0.5) | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parenthesis.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. AS 1 @ 4 to 6 feet is sample AS-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 and 6 feet below ground surface on May 8, 1990.

Table M-3.15. Summary of Analytical Results of PCBs (Aroclor 1248) for Soil Boring Samples from the PCB Disposal Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Interval Depth (feet) Below
Ground Surface | Sample Identification Number | |
|------------------------------------------------------|------------------------------|--------------|
| | PDA-1 | PDA-2 |
| 16 - 18 | 1100 {130} | 0.97 {0.15} |
| 18 - 20 | 5.7 {0.48} | 6.5 {1.0} |
| 20 - 22 | 52 {6.4} | 7.2 {0.96} |
| 22 - 24 | 100 {10} | 17 {2.0} |
| 24 - 26 | 92 {9.7} | 3.6 {0.92} |
| 24 - 28 | 88 {9.1} | 0.1 {0.97} |
| 28 - 30 | 32 {4.7} | 0.46 {0.095} |

Results are reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

The analytical detection limits are presented in parentheses for each sample.

⁽¹⁾Samples were collected on May 15 and 16, 1990.

**Table M-3.16 Summary of Analytical Results of Non-Target Volatile and Semivolatile Organic Compounds for Subsurface Soil Samples.
Monsanto Kearny Plant; Kearny, New Jersey.**

| | Sample Identification Number | | | | | | | | | | | | | |
|-----------------------------|------------------------------|----------------|--------------|-------------------|-----------|---------------|------------|-----------------|-----------------|-----------------|----------------|--------------|--------------|-------------|
| | APSS 146 | APSS 246 | APSS 346 | APSS 346
(dup) | AS 146 | AS 246 | AS 346 | SSP 146 | SSP 246 | SSP 346 | TSP 146 | TSP 246 | TSP 346 | TSP 446 |
| Volatile TICs | | | | | | | | | | | | | | |
| C-Isomer | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | 8 J | 443 J | 3 J | 2.5 J | ND | ND | ND | 33 J | 380 J | ND | ND | 3 J | 70 J | 16 J |
| C-10 Hydrocarbon Isomer | ND | ND | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5 J | ND | ND |
| C-3 Benzene | 23 J | ND | 8 J | 10 J | ND | ND | ND | 211 J | ND | ND | ND | ND | ND | 7 J |
| C-4 Benzene | 1 J | ND | 9 J | 6 J | ND | ND | ND | 37 J | ND | 1,400 J | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2 J |
| Hydrocarbon Unknowns | ND | ND | ND | ND | ND | ND | ND | 17 J | ND | ND | 19 J | ND | ND | ND |
| Unknowns | 9 J | 310 J | 23 J | 4 J | ND | ND | ND | 60 J | 1,311 J | 18,210 J | ND | ND | 35 J | 18 J |
| Total | 42 J | 753 J | 44 J | 23 J | ND | ND | ND | 358 J | 1,691 J | 19,610 J | 19 J | 8 J | 105 J | 43 J |
| Semivolatile TICs | | | | | | | | | | | | | | |
| C-9 Hydrocarbon Isomer | ND | 3 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 Hydrocarbon Isomer | ND | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | 47 J | 8 J | ND | ND | ND | ND | ND | ND | 65 J | 340 J | ND | ND | ND | 25 J |
| C-4 Benzene | ND | 9 J | ND | ND | ND | ND | ND | ND | 110 J | ND | ND | ND | ND | ND |
| nonyl Phenol | ND | 41 J | ND | 250 J | ND | ND | ND | 1700 J | ND | 1,100 J | 1,070 J | 216 J | 390 J | ND |
| 4(1-methyl-1-phenyl) Phenol | ND | ND | 41 J | ND | ND | ND | ND | 620 J | ND | 1,800 J | ND | ND | ND | ND |
| 4 Dodecyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 2,000 J | 4,700 J | ND | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | ND | 270 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1, | ND | 510 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | ND | 48 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetramethyl Butyl Phenol | ND | 110 J | ND | 180 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon Isomers | ND | ND | ND | ND | ND | ND | ND | ND | 84 J | 500 J | ND | ND | 420 J | ND |
| Unknowns | 815 J | 709 J | 519 J | 1,598 J | ND | 0.04 J | 0 J | 12,960 J | 11,430 J | 7,300 J | ND | ND | ND | ND |
| Total | 862 J | 1,421 J | 519 J | 2,298 J | ND | 0.04 J | 0 J | 15,280 J | 13,689 J | 15,640 J | 1,070 J | 216 J | 810 J | 25J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 8, 1990.

AS = Acid Sump Area.

APSS = AP/Sterox Sump Area

SSP = Secondary Settling Pond.

TSP = Tertiary Settling Pond.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively identified compounds from the library search.

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ATTACHMENT 13-D

**Summary of Roux Associates, Inc. Remedial
Investigation Data for Surface Soil Samples
with Location Maps (Item 13)**

Table M-4.1 Summary of Analytical Results of Volatile Organic Compounds and PCBs for Surface Soil Samples. Monsanto Kearny Plant, Kearny, New Jersey.

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| | Sample Identification Number | | | | | | | | |
|--------------------------------|------------------------------|------------|------------|-----------|-----------|-----------|-------------|------------|------------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| TCL Volatile Organic Compounds | | | | | | | | | |
| Acetone (0.01) | 0.66 JBd | ND | ND | ND d | 0.047 JBd | ND d | 0.11 Bd | 0.021 Bd | 0.06 Bd |
| Ethylbenzene (0.005) | ND d | ND | ND | ND d | ND d | 1.2 d | ND d | ND d | ND d |
| Methylene Chloride (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | ND d | ND d |
| Tetrachloroethene (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | 0.031 d | ND d |
| Toluene (0.005) | ND d | ND | ND | ND d | ND d | 0.11 Jd | 0.13 d | ND d | ND d |
| Trichloroethene (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | 0.013 d | ND d |
| Xylenes (total) (0.005) | ND d | ND | ND | ND d | ND d | 0.37 Jd | ND d | ND d | ND d |
| PCBs | | | | | | | | | |
| Aroclor 1248 | 2500 {170} | 1.6 {0.47} | 1.7 {0.89} | ND {0.99} | ND {9.7} | 1.3 {0.9} | 1.7 {0.087} | 7.6 {0.92} | 6.6 {0.94} |
| Aroclor 1260 | ND {340} | 0.9 {0.93} | ND {1.8} | 16 {2.00} | 85 {19} | 1 {1.8} | 1.1 {1.7} | 8.1 {1.80} | 5.6 {1.9} |

Notes:

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected May 22, 1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample.

B = Compound is also Detected in the Method Blank.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not Detected.

N/A = Not Applicable.

d = Detection limits raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

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Table M-4.1 Summary of Analytical Results of Volatile Organic Compounds and PCBs for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

Page 1 of 2

| | Sample Identification Number | | | | | | | | | |
|--------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|------------|-----------|-------------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TCL Volatile Organic Compounds | | | | | | | | | | |
| Acetone (0.01) | 0.058 Bd | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Ethylbenzene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Methylene Chloride (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Tetrachloroethene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Toluene (0.005) | ND d | ND | 71 d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Trichloroethene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Xylenes (total) (0.005) | ND d | ND | 17 Jd | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| PCBs | | | | | | | | | | |
| Aroclor 1248 | 0.7 {0.86} | ND {0.91} | 6.4 {4.6} | 32 {9.0} | 1.2 {0.88} | 120 {9.5} | ND {0.87} | 1.4 {0.43} | 79 {8.9} | 0.7 {0.86}J |
| Aroclor 1260 | 4.6 {18.0} | 4.2 {1.8} | ND {9.2} | ND {18.0} | 3.5 {1.8} | 39 {19} | 3.6 {1.7} | 5.3 {0.87} | 20 {18} | ND {1.7} |

Notes:

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

B = Compound is also Detected in the Method Blank.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not Detected.

N/A = Not Applicable.

d = Detection limits raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

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Table M-4.2. Summary of Analytical Results of Semivolatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

Page 1 of 2

| | Sample Identification Number | | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-0 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TCL Semi-Volatile Organic Compounds | | | | | | | | | | |
| Phenol (0.66) | ND d | ND d | 7.4 Jd | ND d | ND d | 6.3 Jd | ND | 1.2 Jd | ND d | ND d |
| 1,2,4-Trichlorobenzene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Naphthalene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.13 J | ND d | ND d | 0.5 Jd |
| 2-Methylnaphthalene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 0.4 Jd |
| bis (2-Ethylhexyl) Phthalate (0.66) | 1 Bd | 0.9 JBd | 3.3 JBd | ND d | 1.9 JBd | 2.8 JBd | 0.8 B | 1.6 JBd | 8.4 JBd | 1.7 Bd |
| Butyl Benzyl Phthalate (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 1 | ND d | ND d | ND d |
| Di-n-butyl Phthalate (0.66) | ND d | ND d | ND d | ND d | ND d | 25 Jd | 0.1 J | ND d | ND d | ND d |
| Dibenzofuran (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.3 Jd |
| Acenaphthene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Acenaphthylene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 0.3 Jd |
| Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 2.1 d |
| Benzo(a)Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | 2 Jd | 0.5 J | 7.2 d | ND d | 2.5 d |
| Benzo(a)Pyrene (0.66) | 0.1 Jd | ND d | ND d | ND d | ND d | ND d | 0.5 J | 8 d | ND d | 1.9 d |
| Benzo(b)Fluoranthrene (0.66) | 0.2 JLd | ND d | ND d | ND d | 1.7 JLd | 1.9 JLd | 0.8 L | 14 Ld | ND d | 4.1 Ld |
| Benzo(k)Fluoranthrene (0.66) | ND Ld | ND d | ND d | ND d | ND Ld | ND Ld | ND L | ND Ld | ND d | ND Ld |
| Benzo(g,h,i)Perylene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.3 J | 4.6 d | ND d | 0.9 Jd |
| Chrysene (0.66) | 0.2 Jd | ND d | ND d | ND d | 2 Jd | 2.1 Jd | 0.6 J | 7.4 d | ND d | 2.5 d |
| Dibenz(a,h)Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.6 Jd |
| Fluoranthene (0.66) | 0.3 Jd | ND d | ND d | ND d | ND d | 5.1 Jd | 1 | 9.9 d | ND d | 5.7 d |
| Fluorene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.3 Jd |
| Indeno(1,2,3-cd)Pyrene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.3 J | 0.7 Jd | ND d | 0.3 Jd |
| Phenanthrene (0.66) | 0.2 Jd | ND d | ND d | ND d | ND d | 2.7 Jd | 0.3 J | 1.2 Jd | ND d | 3.3 d |
| Pyrene (0.66) | 0.2 Jd | ND d | ND d | ND d | 2.5 Jd | 4.9 Jd | 0.9 | 9.9 d | ND d | 4.4 d |

Notes:

Concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

J = Concentration is detected below the detection limit or is an estimated concentration.

B = Compound is also detected in the method blank.

ND = Not detected.

L = These components are not separable using this method and are therefore quantitated together.

d = Detection levels raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

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Table M-4.2. Summary of Analytical Results of Semivolatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

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| | Sample Identification Number | | | | | | | | |
|-------------------------------------|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| TCL Semi-Volatile Organic Compounds | | | | | | | | | |
| Phenol (0.66) | ND d | 0.9 Jd | 0.9 Jd | 2.8 | 0.5 J | ND d | ND d | 1.4 Jd | 1.5 Jd |
| 1,2,4-Trichlorobenzene (0.66) | ND d | ND Jd | ND d | 0.2 J | 1.3 | ND Jd | ND d | ND d | ND d |
| Naphthalene (0.66) | ND d | 1.2 Jd | 1.1 Jd | 0.3 J | 0.5 J | 0.2 Jd | ND d | 0.3 Jd | ND d |
| 2-Methylnaphthalene (0.66) | ND d | 0.7 Jd | ND d | 0.3 J | 0.5 J | 0.2 d | ND d | ND d | ND d |
| bis (2-Ethylhexyl) Phthalate (0.66) | ND d | 0.8 JBd | 1.4 JBd | 0.9 BJ | 0.9 B | 0.9 JBd | 4.2 JBd | 1.1 JBd | 2.8 Bd |
| Butyl Benzyl Phthalate (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | ND d | ND d |
| Di-n-butyl Phthalate (0.66) | ND d | ND d | ND d | 0.2 J | 0.1 J | ND d | ND d | ND d | ND d |
| Dibenzofuran (0.66) | ND d | ND d | ND d | 0.1 J | ND | ND d | ND d | ND d | ND d |
| Acenaphthene (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | 0.2 Jd | ND d |
| Acenaphthylene (0.66) | ND d | 0.7 Jd | 0.8 Jd | 0.1 J | 0.1 J | ND d | ND d | ND d | ND d |
| Anthracene (0.66) | ND d | 0.5 Jd | ND d | ND | 0.1 J | ND d | ND d | 0.7 Jd | ND d |
| Benzo(a)Anthracene (0.66) | ND d | 1.8 Jd | ND d | ND | 0.3 J | ND d | ND d | 1.3 Jd | ND d |
| Benzo(a)Pyrene (0.66) | ND d | 1.8 Jd | 1.8 Jd | 0.2 J | 0.3 J | 0.2 Jd | ND d | 1.1 Jd | ND d |
| Benzo(b)Fluoranthrene (0.66) | ND d | 3.8 Ld | 3.5 JLd | 0.5 JL | 0.6 JL | 0.7 d | ND d | 1.7 Ld | ND d |
| Benzo(k)Fluoranthrene (0.66) | ND d | ND Ld | ND Ld | ND | ND L | ND Ld | ND d | ND Ld | ND d |
| Benzo(g,h,i)Perylene (0.66) | ND d | 1.1 Jd | ND d | 0.1 J | 0.2 J | ND d | ND d | 0.7 Jd | ND d |
| Chrysene (0.66) | ND d | 2 Jd | 1.8 Jd | 0.5 J | 0.7 | 1.6 Jd | ND d | 1.6 Jd | ND d |
| Dibenz(a,h)Anthracene (0.66) | ND d | 0.6 Jd | ND d | ND | 0.1 J | ND d | ND d | 0.3 Jd | ND d |
| Fluoranthene (0.66) | ND d | 2.7 Jd | 2.8 Jd | 0.3 J | 0.5 J | 0.5 Jd | ND d | 3.4 d | ND d |
| Fluorene (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | ND d | ND d |
| Indeno(1,2,3-cd)Pyrene (0.66) | ND d | 1.2 Jd | ND d | 0.1 J | 0.2 J | ND d | ND d | 0.7 Jd | ND d |
| Phenanthrene (0.66) | ND d | 1.6 Jd | 1.5 Jd | 0.5 J | 0.9 | 0.4 Jd | ND d | 2.7 d | ND d |
| Pyrene (0.66) | ND d | 2.9 Jd | 2.7 Jd | 0.3 J | 0.5 J | 0.4 Jd | ND d | 3.2 d | ND d |

Notes:

Concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample

J = Concentration is detected below the detection limit or is an estimated concentration.

B = Compound is also detected in the method blank.

ND = Not detected.

L = These components are not separable using this method and are therefore quantitated together.

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Table M-4.3. Summary of Analytical Results of Inorganic Parameters for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

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| | Sample Identification Number | | | | | | | | | |
|-------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TAL Metals | | | | | | | | | | |
| Aluminum (29.8) | 4620.0 | 7770.0 | 10200.0 | 7000.0 | 8010.0 | 7560.0 | 5130.0 | 5380.0 | 7130.0 | 8190.0 |
| Antimony (45.4) | 9.7 J | 10.4 J | 10.5 J | 10.3 J | 9.9 J | 10.8 J | 9.8 J | 9.8 J | 29.3 J | 9.8 J |
| Arsenic (47.9) | 4.1 J | 2.2 J | 6.0 J | 5.3 J | 9.4 J | 6.0 J | 5.1 J | 9.5 J | 4.5 J | 10.8 J |
| Barium (0.7) | 49.1 | 79.0 | 34.5 | 39.7 | 74.6 | 162.0 | 49.6 | 54.5 | 66.3 | 183.0 |
| Beryllium (0.3) | 0.4 J | 0.31 | 0.81 | 0.3 | 0.4 | 4.0 | 0.3 J | 0.3 | 0.7 | 0.7 |
| Cadmium (4.5) | 1.0 J | 1.0 J | 1.0 J | 1.0 J | 1.0 J | 1.1 J | 1.0 J | 1.0 J | 1.2 J | 1.0 J |
| Calcium (25.8) | 5280.0 | 5460.0 | 6350.0 | 2920.0 | 5540.0 | 8370.0 | 6660.0 | 6170.0 | 8020.0 | 18000.0 |
| Chromium (3.7) | 26.1 | 29.9 | 24.0 | 21.6 | 20.1 | 92.9 | 18.9 | 17.1 | 48.0 | 369.0 |
| Cobalt (5.1) | 4.2 B | 2.7 J | 13.4 | 9.2 | 34.6 | 31.1 | 5.8 | 6.3 | 10.9 | 9.1 |
| Copper (2.3) | 72.7 | 48.4 | 68.5 | 60.8 | 99.9 | 645.0 | 36.8 | 62.2 | 115.0 | 142.0 |
| Iron (13.5) | 17900.0 | 21900.0 | 34900.0 | 28000.0 | 30100.0 | 32400.0 | 17000.0 | 16200.0 | 23700.0 | 23300.0 |
| Lead (48.1) | 114.0 | 73.3 | 58.7 | 90.1 | 148.0 | 676.0 | 60.7 | 89.2 | 200.0 | 270.0 |
| Magnesium (96.3) | 1140.0 | 960.0 | 6040.0 | 4430.0 | 4380.0 | 2980.0 | 2690.0 | 2660.0 | 6190.0 | 7270.0 |
| Manganese (0.8) | 143.0 | 97.3 | 439.0 | 236.0 | 464.0 | 347.0 | 226.0 | 172.0 | 317.0 | 453.0 |
| Mercury (0.2) | 0.3 | 0.2 | 0.5 | 0.4 | 0.8 | 1.2 | 0.3 | 0.2 | 0.4 | 74.0 |
| Nickel (24.2) | 22.0 J | 14.6 J | 14.8 J | 24.4 | 41.2 | 267.0 | 14.7 J | 21.5 J | 54.3 | 41.5 |
| Potassium (2048) | 1820.0 J | 3200.0 | 106.0 J | 1230.0 J | 1080.0 J | 940.0 J | 1150.0 J | 1040.0 J | 3630.0 | 1220.0 J |
| Selenium (74.4) | 0.4 J | 0.5 J | 0.5 J | 0.5 J | 0.5 J | 1.8 J | 0.4 J | 0.6 J | 0.5 J | 0.7 J |
| Silver (3.2) | 0.7 J | 0.7 J | 0.7 J | 0.7 J | 0.7 J | 0.8 J | 0.7 J | 0.7 J | 0.7 J | 0.7 J |
| Sodium (1814) | 392.0 J | 1840.0 | 418.0 J | 410.0 J | 397.0 J | 1430.0 J | 411.0 | 722.0 J | 578.0 J | 392.0 J |
| Thallium (218) | 0.4 J | 0.5 J | 0.5 J | 0.5 J | 0.4 J | 0.5 J | 0.4 J | 0.4 J | 0.5 J | 0.4 J |
| Vanadium (3.9) | 19.3 | 30.2 | 68.4 | 46.2 | 62.5 | 39.1 | 26.9 | 35.5 | 54.2 | 52.3 |
| Zinc (3.3) | 215.0 | 156.0 | 126.0 | 139.0 | 182.0 | 3380.0 | 143.0 | 89.8 | 424.0 | 249.0 |
| Cyanide (0.5) | ND | 1.9 | ND | 0.70 | ND | ND | ND | ND | ND | ND |

Notes:

All concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument Detection Limit reported in parentheses

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

ND = Not detected.

J = Concentration is detected below the detection limit or is an estimate concentration.

D = Detection limits are raised due to high levels of other analytes or Matrix Interferences.

B = Metal also found in method blank

TAL = Target Analyte List.

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Table M-4.3. Summary of Analytical Results of Inorganic Parameters for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification Number | | | | | | | | |
|------------------|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-22-0S | TSP-SS-01 |
| Tal Metals | | | | | | | | | |
| Aluminum (29.8) | 10700.0 | 6370.0 | 6760.0 | 4070.0 | 3900.0 | 5900.0 | 11400.0 | 4800.0 | 6400.0 |
| Antimony (45.4) | 9.6 J | 10.6 J | 10.1 J | 11.2 J | 11.0 J | 22.7 J | 9.9 J | 10.6 J | 10.4 J |
| Arsenic (47.9) | 4.1 J | 14.4 J | 10.8 J | 20.0 J | 26.6 J | 15.0 J | 1.0 J | 14.7 J | 8.9 J |
| Barium (0.7) | 55.8 | 95.2 | 108.0 | 70.4 | 71.9 | 89.0 | 85.7 | 75.9 | 60.1 |
| Beryllium (0.3) | 0.4 | 0.5 | 0.6 | 0.5 | 0.6 | 0.4 | 1.9 | 0.3 J | 0.4 |
| Cadmium (4.5) | 1.0 J | 1.0 J | 1.1 J | 1.1 J | 1.1 J | 1.0 J | 1.0 J | 1.1 J | 1.0 J |
| Calcium (25.8) | 12100.0 | 3230.0 | 3870.0 | 2290.0 | 2050.0 | 4660.0 | 12900.0 | 5040.0 | 7150.0 |
| Chromium (3.7) | 43.4 | 26.4 | 24.7 | 22.0 | 55.7 | 37.9 | 69.9 | 130.0 | 230.0 |
| Cobalt (5.1) | 13.0 | 7.1 | 6.8 | 8.5 | 5.7 | 9.4 | 21.9 | 6.0 | 10.2 |
| Copper (2.3) | 87.9 | 76.8 | 71.6 | 95.0 | 74.0 | 155.0 | 375.0 | 68.2 | 76.4 |
| Iron (13.5) | 25400.0 | 27200.0 | 27700.0 | 21900.0 | 21200.0 | 23500.0 | 32300.0 | 16500.0 | 22200.0 |
| Lead (48.1) | 162.0 | 159.0 | 153.0 | 188.0 | 217.0 | 472.0 | 392.0 | 160.0 | 136.0 |
| Magnesium (96.3) | 9510.0 | 2210.0 | 2150.0 | 1270.0 | 880.0 | 2190.0 | 8770.0 | 2210.0 | 2850.0 |
| Manganese (0.8) | 315.0 | 572.0 | 338.0 | 243.0 | 170.0 | 310.0 | 382.0 | 249.0 | 461.0 |
| Mercury (0.2) | 0.6 | 1.4 | 1.1 | 0.3 | 0.4 | 0.9 | 0.4 | 0.6 | 0.3 |
| Nickel (24.2) | 34.3 | 14.2 J | 15.5 J | 15.5 J | 28.0 | 48.9 | 199.0 | 28.7 | 68.0 |
| Potassium (2048) | 435.0 J | 1240.0 J | 1600.0 J | 593.0 J | 838.0 J | 628.0 J | 1360.0 J | 1030.0 J | 1040.0 J |
| Selenium (74.4) | 0.4 J | 0.5 J | 0.4 J | 1.0 J | 1.0 J | 1.1 J | 0.4 J | 0.5 J | 0.5 J |
| Silver (3.2) | 0.7 J | 0.8 J | 0.7 J | 0.8 J | 0.8 J | 0.7 J | 0.7 J | 0.8 J | 0.7 J |
| Sodium (1814) | 386.0 J | 422.0 J | 403.0 J | 448.0 J | 440.0 J | 410.0 J | 637.0 J | 425.0 J | 416.0 J |
| Thallium (218) | 0.4 J | 0.5 J | 0.4 J | 0.5 J | 0.6 J | 0.5 J | 0.4 J | 0.5 J | 0.5 J |
| Vanadium (3.9) | 53.8 | 50.4 | 46.1 | 31.9 | 49.6 | 114.0 | 51.3 | 53.5 | 128.0 |
| Zinc (3.3) | 145.0 | 154.0 | 161.0 | 397.0 | 146.0 | 480.0 | 1300.0 | 176.0 | 147.0 |
| Cyanide (0.5) | ND | ND | ND | ND | 0.86 | ND | ND | ND | ND |

Notes:

All concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument Detection Limit reported in parentheses

Samples were collected on May 22, 1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample.

ND = Not detected.

J = Concentration is detected below the detection limit or is an estimate concentration.

D = Detection limits are raised due to high levels of other analytes or Matrix Interferences.

B = Metal also found in method blank

TAL = Target Analyte List.

Samples were collected on May 22, 1990

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Table M-4.4. Summary of Analytical Results of Non-Target Volatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey

| | Sample Identification Number | | | | | | | | | |
|-----------------------------|------------------------------|--------------|----------------|----------------|---------------|--------------|--------------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| Volatile TICs | | | | | | | | | | |
| 1H-Indene,2,3-dihydro-1,1,3 | ND | 0.3 J | ND | ND | ND | ND | 0.4 J | ND | ND | ND |
| Butylheptybenzene | ND | ND | ND | ND | ND | ND | 1 J | ND | ND | ND |
| C-14 H-20 O-2 Isomer | ND | ND | 280 J | 15 J | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C10 Hydrocarbon Isomer | ND | ND | 2,100 J | ND | 0.3 J | ND | ND | ND | ND | ND |
| C9 Hydrocarbon Isomer | ND | ND | ND | ND | 6.4 J | ND | ND | ND | ND | ND |
| Dimethyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Propylnonyl Benzene | ND | ND | ND | ND | ND | ND | 0.1 J | ND | ND | ND |
| Trichlorofluoromethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 0.1 J | ND | 4,691 J | 501.9 J | 6.1 J | 6.4 J | 0.8 J | ND | ND | ND |
| Total | 0.1 J | 0.3 J | 7,071 J | 516.9 J | 12.8 J | 6.4 J | 2.3 J | ND | ND | ND |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 22,1990.

ACD = Acid Sump Area.

APS = Alkyl Phenol Structure.

APSS = AP/Sterox Sump Area.

B02 to B16 = Background Samples

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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Table M-4.4. Summary of Analytical Results of Non-Target Volatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey

| | Sample Identification Number | | | | | | | | |
|-----------------------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03 | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| Volatile TICs | | | | | | | | | |
| 1H-Indene,2,3-dihydro-1,1,3 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Butylheptybenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-14 H-20 O-2 Isomer | ND | ND | ND | ND | ND | ND | ND | 0.1 J | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | 110.0 J | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | 11.6 J | ND | ND | ND |
| C10 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | 8.4 J | ND | ND | ND |
| Dimethyl Naphthalene Isomer | 2.8 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Propylnonyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichlorofluoromethane | ND | 0.01 J | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 16.9 J | 0.1 J | 0.1 J | 0.1 J | 1.56 J | 24.5 J | 5 J | ND | 0.4 J |
| Total | 19.7 J | 0.11 J | 0.1 J | 0.1 J | 1.5 J | 154.5 J | 5 J | 0.1 J | 0.4 J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 22,1990.

* Duplicate sample.

PDA = PCB Disposal Area.

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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**Table M-4.5. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds for Surface Soil Samples.
Monsanto, Kearny Plant. Kearny, New Jersey.**

| | Sample Identification Number | | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-02 | B16-SS-01 |
| Semivolatile TICs | | | | | | | | | | |
| 1,2-Benzenedicarboxylic Acid, Butyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1,3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1,1,3,3-Tetramethylbutyl)-Phenol | ND | ND | 230 J | 510 J | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl)-Phenol | ND | ND | 52 J | ND | ND | ND | ND | ND | ND | ND |
| 4-Dodecyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | 310 J | 2,140 J | ND | ND | ND | ND | 1,100 J | ND |
| 4-Phenyl Bicyclohexyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-1 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-15 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-20 H-12 Isomer | ND | ND | ND | ND | ND | ND | 0.4 J | 6.2 J | ND | 1.5 J |
| C-3 Benzene | ND | ND | 68 J | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | 85 J | ND | ND | ND | ND | ND | ND | ND |
| Bimethyl Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachloro,1,1-Biphenyl | 0.3 J | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachloro,1,1-Biphenyl | 0.2 J | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | 7.1 J | ND | ND | 2.5 J |
| Nonyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Octachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pentachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | 21 J | ND | ND | ND | ND |
| Substituted Benzene | ND | 257 J | ND | ND | ND | ND | ND | 10.5 J | ND | ND |
| Sulfur, Mol. (S8) | 0.2 J | ND | ND | ND | ND | ND | ND | ND | ND | 2.5 J |
| Tetrachloro Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | 15 J | ND | ND | ND | ND |
| Trichloro,1,1-Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | 128 J | 720 J | ND | 378 J | ND | ND | ND | ND |
| Unknowns | 3.3 J | 57 J | 1,487 J | 7,146 J | 123 J | 1,524 J | 1.2 J | 10.1 J | 7,267 J | 5.3 J |
| Total | 4 Jd | 314 J | 2,360 J | 10,516 J | 123 J | 1,938 J | 8.7 J | 26.8 J | 8,367 J | 11.8 Jd |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
Instrument detection limits indicated in parentheses.
Samples were collected on May 22, 1990.
ACD = Acid Sump Area.
APS = Alkyl Phenol Structure
APSS = AP/Sterox Sump Area.
B02 to B16 = Background Samples.
J = Concentration is detected below the detection limit or is an estimated concentrations.
ND = Not detected.
TICs = Tentatively Identified Compounds from the library search.

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**Table M-4.5. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds for Surface Soil Samples.
Monsanto Kearny Plant. Kearny, New Jersey.**

| | Sample Identification Number | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03 | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| Semivolatile TICs | | | | | | | | | |
| 1,2-Benzenedicarboxylic Acid, Butyl | ND | ND | 6.6 J | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1,3 | ND | 55 J | ND | ND | ND | ND | ND | ND | ND |
| 4-(1,1,3,3-Tetramethylbutyl)-Phenol | ND | 5.4 J | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl)-Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Dodecyl Phenol | ND | ND | ND | ND | ND | 1.6 J | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | ND | ND | ND | ND | ND | 3.3 J | ND |
| 4-Phenyl Bicyclohexyl | ND | ND | ND | ND | ND | 2 J | ND | ND | ND |
| C-1 Benzene | ND | ND | ND | 1 J | ND | ND | ND | ND | ND |
| C-15 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | 1 J | ND |
| C-20 H-12 Isomer | ND | 2.3 J | ND | ND | ND | ND | ND | 1 J | ND |
| C-3 Benzene | ND | ND | 5.9 J | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bimethyl Naphthalene | ND | ND | ND | ND | 1.2 J | ND | ND | ND | ND |
| Heptachloro,1,1-Biphenyl | ND | ND | ND | 4 J | 9.4 J | ND | ND | ND | ND |
| Hexachloro,1,1-Biphenyl | 42 J | ND | ND | 5 J | 11.7 J | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | 3 J | 6.4 J | ND | ND | ND | ND |
| Nonyl Phenol | ND | ND | 3 J | ND | ND | ND | ND | ND | ND |
| Octachloro,1,1-Biphenyl | ND | ND | ND | ND | 2 J | ND | ND | ND | ND |
| Pentachloro,1,1-Biphenyl | 514 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, Mol. (S8) | ND | ND | ND | 2.3 J | ND | ND | ND | ND | ND |
| Tetrachloro Benzene | ND | ND | ND | ND | 3.5 J | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | 1,551 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloro,1,1-Biphenyl | 100 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | 4 J | ND | 1 J | ND | 1 J | ND | 4 J | ND |
| Unknowns | ND | 41.5 J | 161 J | 53.6 J | 54.3 J | 20 J | 3,230 J | 41 J | 763 J |
| Total | 2,207 J | 108.2 Jd | 177 J | 69.9 J | 88.5 J | 24.6 J | 3,230 J | 50.3 J | 763 J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples collected on May 22, 1990.

* Duplicate sample.

PDA = PCB Disposal Area.

SSS = Sterox Building.

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

J = Concentration is detected below the detection limit or is an estimated concentrations.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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Table M-4.6. Summary of Analytical Results of Polycyclic Aromatic Hydrocarbons (PAHs) for Phase II Surface Soil Samples. Monsanto Kearny Plant; Kearny, New Jersey.

| TCL Semivolatile Organic Compounds | Sample Identification Number | | |
|------------------------------------|------------------------------|-------|------|
| | B-16* | B-16 | B-10 |
| Naphthalene (0.38) | BDL | 0.86 | 0.98 |
| Acenaphthene (0.38) | 4.6 | BDL | ND |
| Fluorene (0.38) | 3.9 | 0.42 | ND |
| Phenanthrene (0.38) | 3.2 | 4.2 | BDL |
| Anthracene (0.38) | 8.7 | 1.1 | ND |
| Fluoranthene (0.38) | 3.5 | 5.8 | BDL |
| Pyrene (0.38) | 31 | 5.4 | BDL |
| • Benzo (a) anthracene (0.38) | 16 | 2.5 | ND |
| • Chrysene (0.38) | 16 | 3.2 | 8.7 |
| • Benzo (b) fluoranthene (0.38) | 30 | 7.1 | ND |
| • Benzo (a) pyrene (0.38) | 14 | 2.3 | ND |
| • Indeno (1,2,3-cd) pyrene (0.38) | 9 | ND | ND |
| Totals | 116.9 | 32.02 | 8.7 |
| • Total CaPAHs | 85 | 15.1 | 8.7 |

All concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits are reported in parentheses.

Samples were collected March 20, 1991.

J = Result is an estimated concentration.

ND = Not detected.

* Field duplicate sample.

BDL = Compound was detected below detection limit.

TCL = Target Compound List.

Duplicate sample B-16* was sent to the laboratory as blind field duplicate B-3.

• Carcinogenic Polycyclic Aromatic Hydrocarbons (CaPAHs).

ATTACHMENT 14

Description of Asbestos Containing Material (Item 14)

Asbestos Containing Material

It has been previously estimated that approximately 65% of the on-site pipes, tanks, and building insulation, contain asbestos. A contractor with New Jersey certification for asbestos removal will be selected to remove all asbestos containing insulation before any other demolition begins.

#1
Exhibit C

EXHIBIT C
VOLUME 1 - 3

PRELIMINARY REMEDIAL INVESTIGATION REPORT
Volume I of III

MONSANTO KEARNY PLANT
Kearny, New Jersey

August 30, 1991

Prepared for:

MONSANTO COMPANY
Kearny, New Jersey

Prepared by:

ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
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1.0 INTRODUCTION

On behalf of Monsanto Chemical Company (Monsanto), Roux Associates, Inc. is pleased to submit this Preliminary Remedial Investigation Report for the Monsanto Kearny Plant. Monsanto owns and operates an industrial chemical plant located in Kearny, New Jersey that currently manufactures alkylphenol products. Monsanto entered into Administrative Consent Order (ACO) on June 22, 1989, with the New Jersey Department of Environmental Protection (the Department) to implement a Remedial Investigation (RI)/Feasibility Study (FS). The RI was performed to evaluate the sources and extent of polychlorinated biphenyls (PCBs) and other compounds of concern in the soils and ground water and to identify pathways for migration of these compounds of concern. The FS will be conducted to identify and evaluate the most appropriate remedial action(s).

Prior to the execution of the ACO, Monsanto initiated a series of soil and ground-water investigations to evaluate the potential impact to soils and ground water from past site activities. In the late 1960's and early 1970's, heat-transfer fluid containing PCBs was disposed on the site. The initial soil and ground-water investigations focused on the presence of PCBs in soils and ground water at the site. However, other priority pollutants were also targeted during these investigations.

From the earlier investigations, and in support of the ACO, Roux Associates, Inc. developed a Remedial Investigation Work Plan (RI Work Plan), December 18, 1989, and a RI Work Plan-Addendum I (Addendum I), May 18, 1990 and subsequently a Revised RI Work Plan-Addendum II (Addendum II), May 5, 1991, presenting additional Roux Associates, Inc. Remedial Investigation field activities to be performed. The RI Work Plan described potential data gaps from the previous site investigations and identified specific target areas of concern for further characterization based on past site operating practices. Five target areas of concern were identified as former sumps, settling ponds, and disposal areas, the Acid Sump (AS), Alkylphenol/Sterox Sump (APSS), Secondary Settling Pond (SSP), Tertiary Settling Pond (TSP), and PCB Disposal Area (PDA).

The scope of work for the Remedial Investigation included:

- Sampling subsurface soil to delineate the vertical and horizontal extent of the identified areas of concern.
- Sampling surface soils within the targeted areas of concern and site background (perimeter) locations.
- Monitoring air quality during investigative subsurface activities.
- Installing additional and abandoning improperly constructed monitoring wells.
- Evaluating seasonal and tidal fluctuations of ground water.
- Sampling ground water quarterly for 1 year to establish baseline conditions including an evaluation of ground-water elevations, flow direction, and quality.
- Delineating the extent and character, if any, of separate-phase, floating organics underlying the active process area.
- Conducting pumping tests to further define hydraulic parameters in both shallow and deep water-bearing units (zones).
- Preparing a risk assessment to confirm migration pathways, identify receptors, and determine the impact, if any, on human health and the environment.

This report presents the results of the Remedial Investigation conducted by Roux Associates, Inc. Section 2.0 describes the environmental setting and Sections 3.0 and 4.0 present the site history and the results of the previous site investigations, respectively. Sections 5.0 and 6.0 present a description of the field activities and the results of the soils and ground-water investigations. Section 7.0 describes additional activities with results including air-quality monitoring, a ground-water well record search, an evaluation of potential off-site sources, and transport and disposal of waste from subsurface activities. A risk assessment to evaluate potential impact to human health is provided in Section 8.0. Section 9.0 presents the summary and remedial objectives.

2.0 ENVIRONMENTAL SETTING

2.1 Site Location and Description

The Monsanto Kearny Facility is located on Pennsylvania Avenue in the town of Kearny, Hudson County, New Jersey. The site is bordered by the Passaic River on the west, a Conrail Railroad Yard on the north, and to the south and east by warehouses and trucking distribution facilities (Figure 2.1).

Kearny is approximately 9.3 square miles in area. The Monsanto facility occupies approximately 16 acres in Kearny Point, a highly industrialized area of Kearny. The plant site is located on the east bank of the Passaic River, approximately 1.6 miles north of its confluence with the Hackensack River at Newark Bay. Occupancy in the immediate area includes major manufacturing, distribution, and transportation facilities.

The residential area of Kearny is located approximately 2 miles northwest from the plant with an approximate population of 36,000. Harrison, with a population of approximately 12,250 is also located approximately 2 miles west-northwest of the Monsanto facility. The closest residential area, the City of Newark, is located approximately 1 mile west-southwest of the facility, across the Passaic River.

The plant site was used as a rail yard prior to purchase and development by Monsanto in the early 1950s. Current plant operations include the manufacturing of alkylphenols (AP) and the warehousing and distribution of other Monsanto products. AP manufacturing occurs in the production units located in the central region of the site. A present-day site plan is provided as Figure 2.2.

2.2 Surrounding Land Use

The Kearny area is heavily industrialized with petroleum refineries, chemical plants, warehouses and distributions centers, transportation facilities, electric transformer substations, power generating stations, landfills, and related operations. Originally, the area was tidal marshlands

which was reclaimed by artificial drainage and backfilling with dredge spoils and other material. The Soil Conservation Service designates the property as "made land" (Soil Conservation Service, 1987).

A Department well records search indicated the residential areas within a 1-mile radius of the site are not serviced by public or domestic (private) supply wells. The town of Kearny is supplied with potable water by the Kearny Water Department from the Wanaque Reservoir, operated by the North Jersey District Water Supply Commission.

2.3 Regional Surface Water and Drainage

The Monsanto Kearny site is located on Kearny Point, a peninsula bounded to the west by the Passaic River, to the east by the Hackensack River, and to the south by Newark Bay. The flow direction of the two rivers is primarily to the south and all three bodies of water are tidally influenced. Kearny Point is located in a low-lying tidal marsh area which is part of the New Jersey Meadowlands. According to a National Wetlands Inventory (NWI) map (Jersey City Quadrangle, October 1976), the Kearny Plant is not located on or adjacent to any wetlands and is designated as "uplands". A wetland area is identified on the NWI map north of the site, along the northern boundary of the Conrail train yard.

In the 1990 *State Water Quality Inventory Report*, the Department ranked the Lower Passaic River as one of the poorest water qualities in the state due to intensive industrial development of surrounding land, the presence of numerous waste-water discharges, including the Passaic Valley Sewer Commission facility, and other non-point source runoff. The Department has classified the Lower Passaic River as SE3 Waters representing the lowest classification of state surface waters. The rating reflects the continued industrial use intended for the Newark Bay area.

2.4 Regional Topography and Geology

The topography of this area of Hudson County is flat and low lying with elevations between sea level and about 10 feet above mean sea level. The Monsanto Kearny site lies within the New

Jersey Piedmont Lowlands (Newark Basin) Physiographic Province. It is underlain by unconsolidated deposits with depths ranging from 60 to 100 feet below ground surface where fractured shale bedrock of the Triassic Age Brunswick Formation is encountered. Reported thicknesses of the unconsolidated deposits were based on a report from the State of New Jersey Division of Water Policy and Supply (Nichols, 1968).

The unconsolidated deposits consist of Recent Age artificial fill, Quaternary Age fluvial mud and silt with inclusions of peat and other organic materials, and occasional lenses of sand and gravel. These sediments have been deposited on top of Pleistocene Age glacial till consisting of poorly sorted gravels, sand, silts, clays, and glacio-lacustrine clay deposits which, in turn, overlie the bedrock (Herpers and Barksdale, 1951).

2.5 Regional Hydrogeology

As discussed in the previous geologic description, the site overlies unconsolidated fluvial sediments of Recent and Quaternary Age, unconsolidated glacial sediments of Pleistocene Age, and the fractured shale of the Triassic Age Brunswick Formation. Each of these units in the Lowlands are capable of yielding water to wells. The Recent deposits, which according to referenced reports have a reported maximum thickness of 35 feet in the Lowlands are not important sources of water. The permeability of these Recent Age sediments is relatively low. In the lower reaches of the Passaic River, the ground water associated with the unconsolidated fluvial deposits is brackish and may occur under both confined and unconfined conditions. Direct recharge, of approximately 10 to 15 inches annually, is approximately $\frac{1}{3}$ of the average precipitation.

Ground water in the Pleistocene Age glacial deposits in the Lowlands also occurs under both confined and unconfined conditions. Confined conditions occur where silts and clays overlie sand and gravel water-bearing zones or where recent fluvial sediments have been deposited on top of the glacial sediments. Ground-water yields are best from the sand and gravel glacial deposits in areas of buried bedrock valleys (Nichols, 1968). In this type of strata, yields range from 410 gallons per minute (gpm) to 1,593 gpm, and average 908 gpm. Recharge occurs mainly by precipitation falling on outcrop areas or by leakage through overlying confining beds.

In areas where the vertical component of ground-water flow is upward, some recharge may also occur from the underlying and/or adjacent Brunswick Formation.

Rocks of the Brunswick Formation are the major source of ground water for the Lowlands. Shales and sandstones, which make up the Brunswick Formation are capable of sustaining yields that range from 35 gpm to 820 gpm with an average of 364 gpm (Nichols, 1968). Ground water occurs in zones of high secondary porosity caused by weathering and the presence of joint and fracture systems. These systems are generally oriented parallel to the strike of the formation and can allow vertical as well as horizontal movement of ground water. The rock matrix is for the most part impermeable. Confined and semi-confined ground water conditions occur within the rock layers resulting from variations in fracturing and weathering or a combination of both. Additionally, more than one water-bearing zone within the Brunswick Formation may occur. In the Brunswick Formation, recharge to ground water is created by precipitation falling within outcrop areas.

3.0 SITE HISTORY

3.1 Products Manufacturing History

The Monsanto Kearny plant began process operations in 1955. A chronologic summary of primary process operations is outlined in Table 3.1.

The plant first manufactured phosphoric acid and sodium tripolyphosphate (STP). These process units were located in the eastern part of the plant site (Figure 2.2). Later in 1966, new production units for each process (phosphoric acid and STP) were added. The operation of these processes ended in 1985, with the units subsequently dismantled.

The manufacturing of Steroxes began in 1956, followed by the manufacturing of alkylphenols (AP) in 1960. AP is currently manufactured on-site with the process units located in the central portion of the site. Sterox production ended in 1990; the process units are adjacent to the AP units.

The following subsections provide general process descriptions for each manufacturing process. The information presented, including the raw and waste materials and disposal practices associated with each chemical process, was gathered through historical file review and interviewing plant personnel regarding site operations.

3.1.1 Phosphoric Acid Process

Phosphorous (P_4) was received by railroad tank cars and unloaded into storage tanks. From the storage tanks, phosphorous was pumped to the top of the burning tower and oxidized with air to form phosphorous pentoxide (P_2O_5) gas (Figure 3.1). The hot P_2O_5 gas would pass through the bottom of the tower into a hydrator and absorber. Weak phosphoric acid (2% to 5%) was sprayed into the hydrator to cool the hot gases which then continued toward the absorber. In cooling the gases, the dilute acid was concentrated by evaporation, simultaneously supplying water vapor for hydration of the P_2O_5 gas formed in the burning tower. Weak acid sprayed in the absorber reacted with the P_2O_5 gas to form phosphoric acid (H_3PO_4). The acid was either

pumped to storage tanks, pumped to a mix tank for food grade acid production, or pumped to the process tanks for STP production. After leaving the absorber, the remaining P_2O_5 in the gas stream was removed from the scrubber system with a weak acid spray. The P_2O_5 was then recycled through the process again.

3.1.2 Sodium Tripolyphosphate (STP) Process

In general, the process consisted of continuously mixing soda ash and phosphoric acid in varying proportions, drying and calcining the mixture, and grinding the dried solids to produce STP.

Soda ash was received by either railroad hopper cars or by barge and stored in silos (Figure 3.2). The soda ash was fed by conveyor into three mixers, in series, and reacted with phosphoric acid forming a mixture of sodium hydrogen phosphate (Na_2HPO_4) and sodium dihydrogen phosphate ($Na_2H_2PO_4$). Subsequently, the mixture was fed to a dryer where it was steamed with hot gases (approximately $450^{\circ}C$). The gases provided sufficient heat to remove all the free water as vapor from the mixture. The Na_2HPO_4 mixture was sent to a roller mill where the dried solids were ground to specified size and sent by elevator to storage bins.

From the storage bins, the solids were heated in the calciner to approximately $850^{\circ}C$ to vaporize chemically combined water to form Sodium Tripolyphosphate ($Na_5P_3O_{10}$). The heat was supplied by gases from the combustion of natural gas or fuel oil. The exhaust gases from the calciner served as inlet gases for the dryer. Gases exiting the system were passed through exhaust cyclones for dust removal.

The STP product was then cooled and fed by hopper into a mill which ground the product to the desired granular or powdered size. The material was fed through cyclone separator and stored in silos. The product was packed in 100 pound bags and shipped out in bulk either in trucks or hopper cars.

3.1.3 Alkylphenol Process

Alkylphenols are manufactured by reacting the appropriate olefin with phenol in the presence of a catalyst. The process has three main steps: catalyst activation, alkylation, and distillation.

Phenol is received at the facility in tank cars or trucks and unloaded with a pump into the phenol storage tank. Since phenol crystallizes at 40°C, the storage tank is maintained at 50 to 55°C. The phenol storage tank is also maintained under nitrogen pressure because phenol is hygroscopic (will absorb water from the air). The olefins (nonene and propylene tetramer) are received in tank cars or trucks (and in the past, by barge) and are unloaded by a pump into storage tanks.

In the activation step, the catalyst is activated before it is used in the process (Figure 3.3). The catalyst is heated with toluene and phenol to drive out moisture. It is heated again with an olefin, either nonene or propylene tetramer, and after the catalyst is cooled, it is dropped into the reactor. Recently the activation step has been modified by using a dry catalyst to eliminate the use of toluene for moisture removal.

Fresh phenol and olefin are pumped from storage under a controlled flow to begin the alkylation process step. As the flow passes through the fixed bed reactor with the catalyst as the bed, the phenol and olefin are partially converted to alkylphenol. The effluent from the reactor, the alkylated liquor, consists of final alkylphenol product, unreacted phenol, olefin, low boiling and high boiling alkylphenol. The liquor is filtered before going into the nitrogen blanketed alkylated liquor tank.

The alkylated liquor is preheated and then fed into the phenol distillation columns. In the phenol distillation column, the material is heated further until the low boiling fraction comes off overhead as a vapor and is condensed and recycled to the reactor tank. The higher boiling fraction, the crude alkylphenol, comes off the bottom of the column as a liquid.

The crude alkylphenol is then fed into the product column after it had been preheated to 185°C. Here again, the material is heated further to separate the final product from the high boiling

fraction. The final product comes off overhead as a vapor. It is condensed and is fed into a production day tank. The high boiling fraction is also a saleable stream and is maintained within established quality specifications. It can also be recycled to the reactor if market conditions do not warrant resale of the material. The high boiling fraction is a non-hazardous waste, shipped off-site or used in fuel blending.

3.1.3.1 Past and Present Heat-Transfer System: PCB and Non-PCB Liquids

Where the temperatures above 100°C are necessary in the production of alkyphenols, particularly in the distillation steps, a thermal liquid heat transfer system is used. In the past, from 1960 to 1972, the heat-transfer fluid used in the thermal system which contained polychlorinated biphenyls (PCBs), for their fire-resistant and relatively inert characteristics. The system presently is charged with a non-chlorinated biphenyl fluid marketed under a Monsanto trade name, Therminol 66.

The thermal liquid system is a closed recirculating system. It begins when the heat transfer fluid is pumped into the heater or burner where it is heated to above 300°C. The fluid is circulated into the process system and returns to the storage tank, to be pumped back into the burner and recirculated again in order to maintain a steady temperature.

During a process upset, in 1967-68, the reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the fluid became gel-like according to plant personnel. A disposal pit was excavated next to the control room and 2,000 gallons of PCB thermal fluid was drained from the tank and heater through a trench dug to the disposal area, referred to as the PCB Disposal Area (PDA) (Figure 3.4). The system tank was recharged again with chlorinated biphenyl heat transfer fluid (PCB thermal fluid). When the system was converted in 1972 to Therminol 66, a non-PCB fluid, the tank containing 2,000 gallons of PCB thermal fluid was drained again in the same area next to the control room.

In 1981, a new 3,000-gallon tank was installed south of the burner and the old PCB/Therminol tank was dismantled.

3.1.4 Steroxes

Various ethoxylated alkylphenol products (Steroxes) were manufactured by reacting an alkylphenol with ethylene oxide, in varying amounts, in the presence of potassium hydroxide as a catalyst. The three basis process steps are reaction, neutralization, and filtration.

In the reactor preparation stage, the appropriate quantities of alkylphenol and ethylene oxide were transferred from the storage tanks to separate weigh tanks (Figure 3.5). The temperature in the AP weigh tank was raised to 100°C by applying steam to the coils. A 45% potassium hydroxide (KOH) solution was added to the AP weigh tank. The mixture was heated to 160°C for 1 to 1½ hours with agitation and a nitrogen purge to remove the water, and then transferred to the reactor.

The dry alkylphenol-KOH mixture and ethylene oxide were then transferred from the weigh tanks to the nitrogen-pressurized reactor. The total time required for the ethoxylation reaction was approximately 3 hours. On completion of the reaction, the product was cooled and transferred to the neutralization tank.

After the product had been transferred to the neutralization (filter feed) tank, carbon dioxide gas and water was fed to the tank. The neutralized product was then steam heated to 125°C and filtered. Initially, before the filtration process, a small amount of precoat material (filter aid) was added to the precoat tank with a portion of the neutralized batch, and the mixture was circulated to disperse the precoat. The feed was subsequently pumped out of the filter feed tank through the filter to remove precipitated salts and back to the filter feed tank until the filtrate runs clear. Once clear, the final products were pumped to storage.

Most raw materials were supplied by either rail or trucks; Ethylene oxide was received in tank cars. The ethylene oxide unloading and handling operations were closed systems that are maintained under nitrogen pressure to prevent vaporization and fire hazards. The 45% potassium hydroxide (KOH) solution was received by tank truck and unloaded into the KOH storage tank. On-site nitrogen bulk storage facilities were owned and maintained by the nitrogen supplier. They consist of a liquid nitrogen storage tank and a nitrogen vaporizer. Carbon

dioxide was received by tank truck and loaded into a pressurized liquid carbon dioxide storage tank. The tank was owned and maintained by the supplier. Filter aid (cellulose base fibers) was received in 25 pound bags and added as needed to the precoat tank by hand.

3.1.5 Other Products Manufacturing Activities

Other operations on site included extrusion of vinyl siding for a short period from 1967 to 1970. In this operation of PVC pellets, which were shipped to the plant, were extruded through a die to form the desired molding shape.

In 1976, a portion of the site became a corporate distribution/warehousing center for the eastern region and began to warehouse and distribute alkylate, maleic anhydride, STP, and phosphoric acid. These operations continue today.

3.2 Process Waste Streams and Disposal

In the production of phosphoric acid, activated carbon was added to the absorber to remove impurities from the acid stream, and the crude acid was subsequently filtered before being pumped to storage. Filter backwash containing the carbon was emptied into the Acid Sump (AS), located west of the food grade acid storage tanks (Figure 3.4). This AS was operated from 1955 until 1967 when it was backfilled and replaced with an aboveground "redwood" tank. Filter backwash water was pumped from the sump/tank to the STP liquor holding tank and was recycled into the STP process. The remaining filter cake was drummed and landfilled off-site. The production of phosphoric acid ended in 1985.

Past disposal practices for the AP/Sterox production include the use of the former AP/Sterox Sump (APSS) and settling ponds shown in Figure 3.4. The APSS received Sterox filter cake and floor washwater from the AP/Sterox production area during maintenance operations. The waste washwater entered the sump through concrete troughs under the process pumps servicing the AP/Sterox structures. According to interviews with Monsanto employees, the area flooded under heavy precipitation due to shallow water table conditions and relatively low permeable soils. The APSS was connected by an underground clay-tile pipe to the SSP and TSP to catch

overflow from the sump (Figure 3.4). The APSS was manually cleaned of settled solid wastes with the solids transported off site to a landfill.

The APSS and SSP were operated from about 1960 to 1977. The larger TSP was operated from about 1966 to 1970. Presently, washwater and other liquid wastes enter a holding tank south of the AP Structure, the tank, is monitored under EPA guidelines and performance standards established for the Organic Chemicals and Plastic and Synthetic Fibers Industry (OCPSF) before being discharged to the sanitary sewer (POTW) (Figure 3.6). In addition, to control surface flooding, the site has been improved by grading the area with trap rock. Other AP process wastes are spent catalyst and spent light distillation ends. Both wastes are disposed off-site for incineration.

4.0 PREVIOUS SITE INVESTIGATIONS

Subsurface investigation activities began at the Monsanto Kearny Plant in the early 1970s and extended through 1988. They were presented in detail in the Roux Associates, Inc., RI Work Plan, December 18, 1989. The summary of activities and results, which preceded the Remedial Investigation under the ACO, are presented in this section in the following chronology.

- Monsanto 1970s Reviewed historical operating practices and prioritized potential areas of concern.
- Monsanto 1982 Initiated plant program to assess subsurface environmental quality and prevent future releases.
- 1983 Installed 8 ground-water monitoring wells.
- Storch Engineers 1983 Collected 5 surface soil samples and drilled and sampled 29 soil borings in the original PCB disposal area.
- OH Materials Corporation
- 1984 Phase I: Drilled and sampled 10 soil borings in the AP/Sterox process area. Installed and sampled four ground-water cluster well sets and one single well. Excavated 4 test pits in immediate area of cluster wells.
- Phase II: Conducted water-level gauging. Installed and sampled 6 soil borings at secondary settling pond.
- 1985 Phase III: Excavated 13 test pits in the general AP/Sterox process area.
- Phase IV: Installed and sampled 3 additional soil borings. Conducted permeability testing.
- Monsanto 1985 Conducted ground-water sampling.
- OH Materials Corp. 1986 Conducted ground-water sampling. Implemented interim remedial measures.
- 1987 Conducted ground-water sampling.
- Roux Associates, Inc. 1988 Conducted ground-water sampling.

4.1 Monsanto Initial Site Investigation

Based on review of historical plant operations, Monsanto identified several areas of concern related to past plant operations. Subsurface investigations targeted potential areas of concern including the APSS, SSP, and PDA (Figure 4.1).

During the 1970's, as part of a plant program to address areas that potentially present an environmental concern, Monsanto initiated an investigation at the Kearny plant to evaluate the impact of the PCB heat-transfer fluid to soils and ground water in the PDA. The investigations also targeted other potential source areas, i.e., APSS, SSP, and the AP/Sterox production area.

4.2 Monsanto Ground-Water Investigation

Monsanto conducted an initial hydrogeologic investigation at the Kearny plant in 1983. The primary objective was to obtain general site hydrogeologic information by installing ground-water wells.

In August 1983, 5 shallow wells were installed by HP Drilling Inc., a New Jersey certified driller, and labeled OW-1 to OW-5, but designations were later changed to Wells 3 to 7 (Figure 4.2). Wells numbered 4, 5, and 6, were installed along the northern fence of the facility. Well 3 was installed southeast of the Sterox tank and Well 7 was installed southeast of the concrete dike around the propylene tetramer tank. Subsequently, Wells 1, 2, and 8 were installed. Wells 1 and 2 are located northeast of the process areas. Well 8 is located southeast of the process area and adjacent to the Passaic River. The well construction logs were presented in the RI Work Plan, and repeated here because most of these wells (except Well 2) were monitored during the Roux Associates, Inc. Remedial Investigation.

Wells 3 to 7 are approximately 10 feet deep and are cased with 4-inch diameter, Schedule 40, PVC casing with 0.02 inch slotted screen at the bottom 5 feet of each well. The annular space was packed with sand around the screen followed by bentonite and grout (telephone communication with HP Drilling, Inc., 11/15/89). The wells were protected with a steel surface casing and locking cap. The wells were developed by pumping each well for 1 hour using a

centrifugal pump and yielded between 2 to 10 gallons per minute (gpm). Static water levels ranged between 34 and 46 inches below ground surface. Three additional wells, identified as Well 1, Well 2, and Well 8, were subsequently installed in a manner similar to Wells 3 through 7 (Figure 4.2). Construction details were not provided, these wells were field measured for total depth. Wells 1 and 8 are approximately 10 feet deep. The total depth of Well 2 is approximately 18 feet below ground surface. Well sampling is discussed in Section 4.4.2.

4.2.2 Assessment of Site Geology and Hydrogeology (1983-1988)

The following is an evaluation of the site geology and hydrogeology from the Monsanto, Storch Engineering, and OHM remedial investigations from 1983 to 1986. The results of these evaluations were useful to design the Roux Associates, Inc. Remedial Investigation.

Geology

Four lithologic units were described in the geologic logs from subsurface investigations. The first unit was described between approximately 0 to 6 feet below ground surface, as fill material composed of poorly sorted sand and gravel with silt. The second unit was described as a 5 to 8 foot thick layer of organic silts or peat extending between 11 and 14 feet below ground surface. An approximately 12 foot thick layer of silty sand was noted between 11 and 28 feet below ground surface. At 28 feet below ground surface a layer of organic silt and clay was described. These observations were modified during the Roux Associates, Inc. Remedial Investigation and are presented in Section 6.

Hydrogeology

Ground-water sampling and monitoring results were useful to evaluate ground-water flow and ground-water quality. Other hydrogeologic characteristics including hydraulic conductivity, permeability and hydraulic gradient were assessed during these site investigations.

Two water bearing zones were identified within 28 feet below ground surface. An unconfined upper water-bearing zone, within the first lithologic unit and a semi-confined lower water-

bearing zone within the third lithologic unit. The upper water-bearing zone was estimated to flow south-southeast towards the Passaic River. The lower water-bearing zone was estimated to flow to the south-east. Both water-bearing zones drained to the Passaic River. A hydraulic gradient of 0.005 and 0.01 ft/ft was estimated for the upper and lower water bearing zones, respectively. A ground-water flow rate of 0.03 feet per day was also estimated.

Slug tests and permeability tests were conducted by OHM to evaluate hydraulic conductivity of the ground-water, which was estimated between 4 to 40 gallons per day per square foot. The evaluation of water quality from these preliminary site investigations is presented in this section.

The results of the geologic and hydrogeologic assessments from the Roux Associates, Inc. Remedial Investigation are presented in Section 6.

4.3 Storch Engineers Soil Borings and Sampling

The Storch investigation included three series of soil borings and sampling. The soil study focused on the area east of the AP control room building where the heat-transfer fluid containing PCBs had been disposed. The primary objective was to evaluate the presence or absence of PCBs in the immediate area. Activities to collect and analyze the soil samples were described in detail in the RI Work Plan and summarized below.

Twenty-nine soil borings (B-1 to B-29) were advanced by Jersey Boring, a certified New Jersey driller, between September 1983 and February 1984. The boreholes were sampled at 2 foot intervals with 2-inch diameter split spoons and analyzed at a New Jersey certified laboratory for PCBs. Nineteen of the borings were advanced within a 25-foot radius of the PDA. Subsurface borings were also advanced at four background locations approximately 50 feet north of the PDA, along the northern property boundary. Three soil borings were advanced about 50 feet west of the PDA and two bore holes were drilled about 150 to 200 feet southwest of the PDA.

The borings were drilled to 8 feet, with the exception of B-24 which was drilled to 12 feet, and B-25 to B-29 which were drilled to 16 feet. Additionally, five surface soil samples (GS-1 to GS-5), were collected at 1 foot below ground surface within the PDA and at background locations.

The laboratory analysis of PCBs are presented in Table 4.1. The PCB distribution, presented on the isoconcentration map (Figure 4.3 to 4.11), indicates that concentrations of PCBs are highest within the PDA and decrease with distance from the PDA. The concentrations of PCBs in the soil are highest at the surface and decrease at depths of 6 to 12 feet below ground surface. An increase in PCB concentrations between 12 and 16 feet may have resulted from disturbances during the 1979 soil excavation activities.

The PCB results from the Storch Engineering subsurface soils investigation were used to partially delineate the vertical and horizontal extent of the PDA. The results are compared with those of the Roux Associates, Inc. Remedial Investigation in Section 5.3.5.

4.4 OHM Soils and Ground-Water Activities

In 1984 OH Materials Corporation (OHM) was contacted by Monsanto to perform additional environmental investigations. The OHM objectives continued to define site hydrogeologic characteristics, determine the extent of PCBs in soil and ground water, and evaluate alternative remedial responses. The investigation program occurred in four phases including well installation, ground water monitoring and sampling, subsurface soils investigations (test pits and soil borings), and free-phase floating product delineation.

The details of the phased investigation are presented chronologically in the RI Work Plan. For this report the activities to evaluate ground-water and subsurface soil conditions are presented as they relate to the Roux Associates, Inc. Remedial Investigation.

4.4.1 Previous Subsurface Soils Investigation (1983-1988)

The OHM subsurface soils investigations involved a phased approach which included drilling 10 shallow and deep soil borings in the AP/Sterox process area in September 1984. Also, 6 soil borings were installed in December 1984 to analyze the soil for vertical and horizontal distribution of PCBs. Additionally, four test pits were dug in October 1984, and 13 additional test pits were subsequently excavated in June 1985 to delineate free-phase floating product. In

Phase IV, three soil borings were drilled to test soil physical parameters for the installation of a remediation system.

4.4.1.1 Phase I Shallow and Deep Soil Borings (September 1984)

Eight shallow (10 feet below ground surface) borings, S-1 to S-8, and 2 deep (installed to 30 feet below ground surface, but sampled only to a depth of 10 feet) borings, D-1 and D-2, were drilled. The locations of the borings were distributed throughout the process area as shown in Figure 4.2. The descriptions of soil borings and stratigraphy were presented in the RI Work Plan. The analytical results of the samples are presented in Table 4.2. The results indicate that PCBs occur at locations identified as former sumps and ponds and at the PDA at borings S-3, S-4, and S-6. Also the highest concentrations of PCBs are identified at approximately 4 and 8 feet below ground surface, the estimated nominal bottom of settling ponds and sumps.

4.4.1.2 Test Pits and Sampling (October 1984)

Based on review of historical operations and observations of an oily residue in previous soil samples, four test pits were excavated on October 3, 1984. The test pits were performed to evaluate amounts and types of free-phase product.

Four test pits, TP-9, TP-10, TP-11, and TP-12, were excavated between 3 and 5 feet deep with a backhoe, next to well couplets 9S and 9D, 10S and 10D, 11S, and 11D, and 12S and 12D, respectively (Figure 4.12). Test pits were kept open for at least one hour to obtain a grab sample from the water surface, and in order to bias the sample towards nonaqueous phase floating liquids. Approximately 3 inches of black, free-phase, floating organics accumulated in TP-11. Aqueous samples were collected from each pit and sent to a certified New Jersey laboratory for analysis of priority pollutant volatiles, metals, and PCBs. After samples were collected, test pits were backfilled with excavated soil.

The analytical results presented on Table 4.4 indicate that PCBs were identified at 0.1 mg/kg in sample TP-9 only. Arsenic, copper, selenium, and zinc were quantified between 0.05 and 0.72 mg/kg in the four samples. Several volatile organic compounds were identified at elevated

concentrations in Sample TP-11, which contained the free-phase floating organics. These compounds may be directly associated with raw materials and process products handled at the AP/Sterox production area.

4.4.1.3 Phase II Soil Borings (November-December 1984)

The results of the OHM Phase I and Storch investigations indicate that soils within the AP/Sterox process area, i.e., APSS and SSP, contain PCBs. In December 1984, OHM drilled 6 additional soil borings to a depth of 10 feet, labeled A through F, (Figure 4.13) to attempt to define the areal extent of PCB concentrations associated with the APSS and SSP. Sampling and analytical activities were described in detail in the RI Work Plan. The PCB results are presented in Table 4.3. Concentrations decrease at 8 feet, or below the estimated nominal bottom of the settling ponds.

4.4.1.4 Phase III Test Pits (June 1985)

Additional test pits (TP-1 to TP-13) were excavated (Figure 4.14) in June 1985 between 2½ and 4 feet deep. The pits were excavated to observe the extent of free-phase floating organics and residue in the AP/Sterox area. Observations and odor were recorded, but no samples were obtained. Surfactants appeared present by their foamy nature in TP-1, TP-2, and TP-3. Odors and sheens were identified at TP-4 and TP-6 through TP-11. A distinct black organic layer was reported at TP-12.

4.4.2 Ground-Water Investigation

The OHM investigation included well installation to monitor the shallow and deep ground-water bearing zones. A sampling program was implemented to monitor components in ground water periodically over a 3-year period. Subsequently, ground-water sampling was conducted by Monsanto and Roux Associates, Inc. OHM identified some of the geologic and hydrogeologic conditions of the water-bearing zones beneath the site. The well sampling activities and preliminary geologic and hydrogeologic assessments are presented in the following sections.

4.4.2.1 Ground-Water Well Installations (September and October 1984)

In September and October 1984, OHM installed four well couplets of monitoring wells. The well couplets were located within 10 feet of each other; one to monitor the shallow water-bearing zone (approximately 10 feet below ground surface) and one to monitor the deep water-bearing zone (approximately 30 feet below ground surface). The well couplets were designated 9S and 9D, 10S and 10D, 11S and 11D, 12S and 12D. An additional well 3S was also installed. The well locations are identified on Figure 4.12. Well installation was described in detail in the RI work plan and presented again in this report because wells 9S, 10S, 11S, and 12S were retained for use in the Roux Associates, Inc. Remedial Investigation. The shallow wells were augured, without the collection of split-spoon samples except for 9S which was sampled continuously. The retained borehole samples were analyzed for PCBs by a New Jersey certified laboratory. The wells were constructed of 4-inch diameter flush joint, Schedule 40, PVC. The bottom of the shallow wells were cased with 5 feet of 0.02 inch slotted screen. The annular space of each well was backfilled with silica sand to 5 feet above the screen. Approximately 2 feet of bentonite was placed above the sand pack and then backfilled with natural soil. Each well has a protective steel casing, locking cap, and a cement collar to prevent surface water infiltration.

4.4.2.2 Monitoring Well Sampling (1984-1987).

From 1984 to 1986 ground water was sampled and analyzed on seven occasions. Two rounds of ground-water sampling were conducted by Monsanto, four by OHM, and one by Roux Associates, Inc. Samples were analyzed for PCBs and priority pollutants with some changes in the parameter list from one sampling event to the next. The sampling and analytical procedures were reviewed by Roux Associates, Inc. in detail and are presented in the RI Work Plan. The results are presented in Table 4.5 to 4.11 and the following subsection summarizes the results of ground-water analysis from 1984 to 1986.

PCBs were identified in Wells 9S and 9D at concentrations under 20 ppb. Volatile organic compounds, which were typically identified, at concentrations of less than 10 ppb, included

benzene, ethylbenzene, toluene, total xylenes, chloroform, and, 1,1,1 trichloromethane. The occurrence of volatile organic compounds was inconsistent from one sampling event to the next.

Semi-volatile compounds were also detected at concentrations which varied from one sampling event to the next. Compounds identified included acenaphthene, fluorene, fluoranthene, naphthalene, phenanthrene, and pyrene. Phenolic compounds were identified in shallow and deep wells for all the sampling events. Additionally, isomers of dichlorobenzene were detected in Wells 10D and 11D in sampling events during 1986 and 1987.

4.4.3 Interim Remedial Measures

From the completed subsurface evaluation, OHM designed a recovery system and interceptor trench to attempt to remediate environmental conditions at the site. Prior to the implementation of the interim remedial measures, soil permeability testing and hydraulic conductivity was completed. OHM began initial construction and implementation of the recovery system and interceptor trench in 1986 and 1987. Due to problems associated with the installation of the well points, such as well points screened to ground surface and clogged with bentonite packing, the system was never operated and was subsequently disconnected.

A baffle drain/interceptor trench was designed as an alternative system. This passive system consists of a carbon-steel trough placed perpendicular to ground-water flow to intercept floating separate-phase organics. The trench is approximately 3 feet deep and has a perforated steel plate on the upgradient side and a solid plate on the downgradient side. Ground water, along with floating product, is intercepted in the trench and channeled toward one of three basins. The basins are formed from 3-foot diameter reinforced concrete pipe set on end with gravel in the bottom for drainage. Floating separate-phase organics can be skimmed or pumped from the water surface within the trench and basins. Accumulations of separate-phase organics have not been observed since trench installation and the basins are currently monitored and logged for water levels and visual observations on a daily basis.

4.5 Other Investigations

As part of their facility improvements, Monsanto upgraded the concrete tank dikes to minimize the effect of any potential future spills. During excavation in September 1986 of the fuel tank dike east of the AP/Sterox building, Monsanto observed an oily residue. The residue in the material was evaluated by laboratory analysis to be a mixture of No. 6 and No. 4 fuel oil. PCBs, metals, pesticides, and herbicides were not identified, and the samples were identified as non-corrosive and non-reactive.

4.6 Summary of the Previous Site Investigations (1983 - 1988)

Subsurface investigations conducted at the Monsanto Kearny Plant, prior to the ACO and Roux Associates, Inc. Remedial Investigation included the installation and sampling of soil borings, test pits, and ground-water wells. These investigations focused on the evaluation of previously identified areas of possible concern, including the former PDA and APSS and associated settling ponds. The results of soil sampling allowed for extensive delineation of PCB-contaminated soils and provided confirmation of suspected source areas. The area underlying the active production units showed evidence of soil saturation by organic compounds used or produced at the plant; however, there was no evidence of significant floating, separate-phase organic accumulation or migration.

Hydrogeological investigations indicated the presence of two shallow water-bearing zones, separated by a continuous confining peat and clay stratum. Permeability testing conducted at the site indicates low hydraulic conductivities, and gauging data indicated ground-water flow direction toward the Passaic River which serves as a local discharge boundary. Multiple ground-water sampling events conducted at the site indicate no significant migration of PCBs and have identified the possible presence of contamination from an off-site upgradient source, particularly in the lower water-bearing zone.

Monsanto previously eliminated the use of PCBs or PCB-containing materials at the site and upgraded active process areas to prevent any incidental release of process materials to the

subsurface. In addition, an interceptor trench was installed along the downgradient edge of the active process area to prevent possible migration of separate-phase organics.

The results of the previous site investigations provided background material to prepare the direction of the Roux Associates, Inc. RI Work Plan.

5.0 SURFACE AND SUBSURFACE SOILS INVESTIGATION

The extensive surface and subsurface soils investigation which had been previously conducted at the Monsanto Kearny Plant provided data which identified three areas of concern; the PDA, APSS and SSP. Roux Associates, Inc. also conducted a review of past practices and aerial photographs to confirm the results of earlier site investigations. From this review two additional areas of potential concern were targeted; the AS and TSP. Section 4 presented the potential areas of concern in Figure 4.1.

Roux Associates, Inc. remedial soil investigation was established to further to delineate vertical and horizontal extent of the impact within the targeted areas of concern. The subsurface soil sampling strategy was established as a multiphased approach beginning with horizontal delineation (at 4 to 6 foot depths; the estimated bottom of the sumps and pond) and subsequently assessing the vertical extent of impacted soil. Additionally, the sampling included surface soil throughout the process area, within the potential area of concern, and at four background locations. The surface and subsurface sampling activities and results are presented in this section. The Quality Assurance/Quality Control (QA/QC) procedures for field activities are presented first, as they apply to the sampling.

5.1 Soil Sampling Quality Assurance/Quality Control Program

The field QA/QC program was performed in accordance with Department requirements as described in the Hazardous Waste Programs' Field Sampling Procedures Manual, February 1988.

The following QA/QC activities were performed in the field. Trip blanks accompanied volatile organic sample containers from the laboratory to the field and back to the laboratory. The trip blank consisted of laboratory-prepared, analyte-free water which was maintained under custody during sampling, transport, and delivery. Field blanks, collected each day, were obtained by pouring laboratory-supplied analyte-free water over a representative piece of field equipment between decontamination and sampling. Additionally, sample material was collected from

selected locations for matrix spike and matrix spike duplicate analyses. The results were used to evaluate sampling and analytical precision, accuracy, and integrity.

Field and QA/QC samples were collected in laboratory-prepared sample containers. The samples were collected, labeled, and wrapped in dedicated plastic bags. Volatile organic samples were preserved with hydrochloric acid (HCL) at a pH of less than 2 and inorganic samples were filtered in the field and similarly preserved using nitric acid (HNO₃). Samples were stored in coolers at 4° C and custody forms were maintained for each shipment. A custody seal was placed on the cooler prior to pick-up by the courier. Measurements and observations, including the appearance and presence of odors were recorded in a bound notebook.

Soil samples were retained for analyses and sent to ENSECO East, a New Jersey certified laboratory (Certification No. 18725) via courier service at the end of each day. Phase I analytical procedures followed the Department's Tier I guidelines for analysis. Soil samples collected during Phase II were analyzed following the Department's Tier II guidelines with 10 percent of the samples analyzed by Tier I procedures.

Roux Associates, Inc. conducted a QA/QC data validation on a portion of the Tier I data from Phase I soil sampling. A Data Validation Report - Soils Analysis, was submitted July 17, 1991 to the Department. At the Department's request, analytical data packages will be held, until requested. Laboratory procedures are presented in sections below.

5.1.1 Field Equipment Cleaning

The following field equipment procedures were followed, in accordance with Department approval, for obtaining soil samples for laboratory use.

- Wash with non-phosphate detergent solution.
- Rinse with potable water.
- Rinse with distilled/deionized, analyte-free water.
- Rinse with a 10 percent nitric acid solution (if metals are to be analyzed).

- Rinse with distilled/deionized, analyte-free water (if metals are to be analyzed).
- Rinse with methanol.
- Rinse with hexane.
- Air dry.
- Rinse with distilled/deionized, analyte-free water.
- Wrap equipment with aluminum foil until use.

QA/QC and equipment cleaning procedures were maintained through sampling and analytical activities.

5.2 Subsurface Soil Sampling and Analysis

The subsurface soil sampling strategy was determined initially by reviewing the results of the soil boring samples from previous investigations. The initial (Phase I) subsurface soil samples were collected at depths of 4 to 6 feet below ground surface, the estimated nominal bottom of the ponds and sumps. Sampling within the PDA followed a modified sampling strategy, which included sampling between 16 and 30 feet below the surface. The sampling objectives, methods, and results of PDA subsurface sampling will be addressed in Section 5.3.5. After the review of the Phase I samples, the Phase II soils investigation was implemented.

In the RI Work Plan, the Phase II samples for vertical delineation had been planned at 8 to 10 feet and 15 to 17 feet intervals. The objective was to keep the soil borings above the peat layer. After completing the Phase I investigation, this strategy was modified to collect soil borings from the 9 to 11 feet interval. This modification was made because the Phase I soils investigation indicated the peat and clay layer occurred at an average depth of 11 feet below the surface.

The proposed Phase II soil sampling activities were presented to the Department in a draft Addendum II, March 4, 1991. The Department approved the Addendum II with modification in a letter April 1, 1991. Roux Associates, Inc. submitted a Revised Addendum II on May 3, 1991. The results of subsurface soil sampling for Phase I and Phase II sampling and analysis

are presented in the following sections. Subsurface soil boring locations are presented on Figure 5.1.

5.2.1 Soil Sampling and Analytical Procedures

Soil borings were advanced to depths of 4 to 6 and 9 to 11 feet below ground surface, which represent the estimated nominal bottom of sumps and ponds and the average depth of the peat and clay lithologic unit, respectively. The sample identification is a combination of soil boring location and depth interval of the sample. For example, the sample TSP-146 is taken from the Tertiary Settling Pond (TSP), at soil boring location one (1) from a depth of 4 to 6 (46) feet. Soil borings were continuously split spoon sampled, inspected, lithologically logged, and screened with an Organic Vapor Meter (OVM) by Roux Associates, Inc. The geologic logs are provided in Appendix A. Samples obtained at selected depths described below were retained for laboratory analysis. The samples were collected using precleaned and wrapped split-spoons at each location. Drilling augers used during soil sampling were steam-cleaned after drilling was completed within the target area of concern.

Disposable gloves and pre-cleaned, stainless-steel spoons were used to extract soil samples from the middle of the 2-foot long split spoons. The top and bottom 6 inches of the split-spoon sample were discarded. Each sample was placed carefully into laboratory-supplied, pre-cleaned and labeled sample containers for analysis. Samples for volatile organic analysis were collected first and the remaining sample was composited by homogenizing in a pre-cleaned, stainless-steel bowl before sample containers were filled. Samples were labeled and preserved following procedures presented in Section 5.1. Laboratory analysis is described below for Phase I and Phase II soil sampling.

5.3 Phase I Subsurface Soil Sampling and Results

During the Phase I sampling, 13 soil samples were obtained from the former sumps and settling ponds at 4 to 6 foot intervals below grade.

Three soil borings were located within and around the former AS, APSS, and SSP. Four soil borings were located within and around the former TSP. Based on historic records, one soil boring was located in the estimated downgradient direction of each former sump and settling pond and the other soil borings were located within the estimated boundaries of the targeted areas.

Each soil boring was continuously split spoon sampled for approximately 6 feet. The samples were lithologically evaluated and logged, and tested with an OVM. A sample obtained from the 4 to 6 foot depth was retained for laboratory analysis.

Laboratory analytical procedures were presented to the Department in the RI Work Plan and Addendum I and subsequently approved by the Department. The Department selected the Phase I parameters from the USEPA Contract Laboratory Program (CLP). This included Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and PCBs. Target Analyte List (TAL) metals and cyanide were also included.

The analytical procedures specified identification of VOCs and SVOCs using EPA Methods 8240 and 8270, with a 30 compound library search for non-target compounds or Tentatively Identified Compounds (TICs). The laboratory used EPA Method 8080 for PCBs and EPA SW-846 methods for Target Analyte List (TAL) metals and cyanide.

The sample results were examined, for the presence of compounds and concentrations at which they occurred, to evaluate the horizontal extent of the areas of concern. Based on the results which are discussed below, recommendations for Phase II sampling are outlined in Section 5.4.

5.3.1 Tertiary Settling Pond Soil Boring Locations and Results

The former TSP is located in the western portion of the current production area on the site and is labeled Area 1 on Figure 4.1. Locations of the soil borings in and around the TSP are presented in Figure 5.2.

Soil Boring TSP-1 was advanced within the estimated northeastern corner of the TSP. Soil Boring TSP-2 was located by the estimated eastern boundary, and Soil Boring TSP-3 was located within the estimated southwestern boundary. Soil Boring TSP-4 was advanced at an estimated downgradient location (southwest) from the former TSP. The analytical results of Phase I samples are provided on Tables 5.1 to 5.3 for organic TCL. The results for the inorganic TAL analyses are presented in Table 5.4.

The target VOCs and SVOCs were not detected in the samples from the TSP, however PCBs were detected. In Sample TSP-1, total PCBs were estimated at 11 milligrams per kilogram (mg/kg). In other samples from the TSP, total PCBs were estimated at less than 4 mg/kg.

Results for inorganic analyses are positive for most of the TAL parameters. Common soil components such as calcium, magnesium, potassium, and sodium are present. Also, heavy metals including arsenic, chromium, lead, vanadium, and zinc were identified.

The results of the semivolatile and volatile TICs indicate that the compounds 1,1,3,3-tetraethyl phenol, nonyl phenol, and 4-nonyl phenol were estimated at concentrations between approximately 200 and 1,100 mg/kg in Samples TSP-1, TSP-2, and TSP-3. Total estimated results for TSP-4 were 25 mg/kg of C-3 benzene. The TIC results are presented on Table 5.16.

In summary, the distribution of TCL and TIC volatiles, TCL and TIC semivolatiles, PCBs, and metals do not indicate the former TSP as a potential area of concern. However, it is suspected that an inlet from the former SSP may have drained to the southeast corner of the TSP. Therefore, a sample was recommended for the Phase II investigation. (See Section 5.4).

5.3.2 Secondary Settling Pond Soil Boring Locations and Results

The former SSP, located within the current production area and west of the above-ground storage tanks, is Area 2 on Figure 4.1. The locations of the soil borings advanced in and around the SSP are presented on Figure 5.3.

Soil Borings SSP-1 and SSP-3 were advanced along the estimated eastern and western boundaries of the former settling pond. The Soil Boring SSP-2 was advanced just outside the estimated southeastern corner of the boundary of the former settling pond. The original location of this selected downgradient sample was modified due to limited access to the area. The analytical results from Phase I are presented in Tables 5.5 to 5.7 for TCL organic analyses. The results for inorganic TAL analyses are presented in Table 5.8.

The VOC toluene was identified in Sample SSP-1 at 58 mg/kg. Ethylbenzene was detected below the instrument detection level and estimated at 2.3 mg/kg. The SVOC phenol was identified in Sample SSP-2 at 140 mg/kg and estimated (below instrument detection) in Sample SSP-3 at 110 mg/kg.

PCB Aroclors 1248 and 1260 were identified in the samples. The results of the total PCB concentrations were 323 mg/kg in Sample SSP-1, 48 mg/kg in Sample SSP-2, and 78 mg/kg in Sample SSP-3. Previous soil boring sampling in the SSP area, summarized in the RI Work Plan on Table 4.3, showed PCBs were detected at the 4 to 6 foot interval in Samples E and F at 1 mg/kg and 9 mg/kg, respectively (Figure 4.13).

Results for inorganic analyses are positive for most of the TAL parameters. Common soil components such as calcium, magnesium, potassium, and sodium are present. Also, heavy metals including arsenic, chromium, lead, vanadium, and zinc were identified.

Volatile TICs including C-9 hydrocarbon isomers, C-3 benzene, C-4 benzene, hydrocarbons, and unknowns were identified at concentrations ranging between approximately 350 mg/kg in Sample SSP-1 to 20,000 mg/kg in Sample SSP-3. The range for semivolatile TICs was between approximately 13,000 mg/kg in Sample SSP-2 and 15,000 mg/kg in Sample SSP-3. The TICs included 4-nonyl phenol, 4(1-methyl-1-phenyl) phenol, 4-dodecylphenol, C-3 benzene, C-4 benzene, hydrocarbon isomers, and unknowns.

The Phase I results indicate that the three SSP samples were probably obtained from within the former settling pond. Based on these results, further confirmation sampling was recommended

for vertical and horizontal delineation in Phase II. The locations of Phase II samples are presented in Section 5.4

5.3.3 A/P Sterox Sump Soil Boring Locations and Results

The location of the former APSS is at the center of the current production area and near the AP Structure. It is labeled Area 3 on Figure 4.1. The locations of the soil borings advanced in and around the APSS are presented on Figure 5.4.

Soil Borings APS-1 and APS-3 were advanced along the estimated eastern and western boundaries of the former sump. Soil Boring APS-2 was advanced at a location downgradient of the APSS. This sample represents the proposed downgradient location based on the historic records. Samples were obtained between 4 to 6 feet below grade. Analytical results from the Phase I investigation are presented in Tables 5.9 to 5.11 for TCL organic parameters. Results of TAL inorganic parameters are presented on Table 5.12.

The VOC analysis identified toluene at 2.5 mg/kg in Sample APS-1. Other VOCs were not identified in the samples. The SVOC analysis identified phenol at 56 mg/kg in sample APS-1 and 840 mg/kg in sample APS-2. TCL semivolatiles were not identified in sample APS-3.

In the three samples, PCBs Aroclors 1248 and 1260 were identified. Total PCBs were 256 mg/kg in Sample APS-1; 708 mg/kg in Sample APS-2; and 14 mg/kg in Sample APS-3. Previous results of soil boring sampling, conducted between 1983 and 1985 in the AP/Sterox area, were first presented in the RI Work Plan and were summarized in Section 4. (Table 4.1 to 4.3). The results show that PCBs were detected at the 4 to 6 foot depth interval. Concentrations of total PCBs were below the detection limit in Soil Borings B-23 and B, at 29 mg/kg in Soil Boring B-29, at 23 mg/kg in Soil Boring S-3, at 227 mg/kg in Soil Boring S-4, at 46 mg/kg in Soil Boring A, at 14 mg/kg in Soil Boring C, and at 4 mg/kg in Soil Boring D. Locations of these boreholes are presented on Figures 4.12 and 4.13.

Results for inorganic analyses are positive for most of the TAL parameters. Common soil components such as calcium, magnesium, potassium, and sodium are present. Heavy metals including arsenic, chromium, lead, vanadium, and zinc were also identified.

The estimated TIC volatiles included C-isomer, C-9 hydrocarbon isomer, C-10 hydrocarbon isomer, C-3 benzene, C-4 benzene, and unknowns. The same set of non-target compounds (excluding the C-isomers) were also identified in the semivolatile TICs. In Sample APS-1 the total volatile TIC concentration was 42 mg/kg and the total semivolatile TIC concentration was 862 mg/kg. In Sample APS-2 the total volatile TIC concentration was 753 mg/kg and the total semivolatile TIC concentration was 1,421 mg/kg. In Sample APS-3, the total volatile TIC concentration was 44 mg/kg. In Sample APS-3, total semivolatile TIC concentration was 519 mg/kg.

The sample results were examined to confirm the location of the estimated boundaries. The sample results indicate that the boundaries of the estimated former sump to extend further south and east than originally estimated. Therefore Soil Boring APS-1 and APS-2 represent the nominal bottom of the former sump and that APS-3 is probably outside the sump boundary.

Based on these results, further confirmation (Phase II) sampling was recommended for vertical and horizontal delineation. The locations of the proposed samples are presented in Section 5.4.

5.3.4 Acid Sump Soil Boring Locations and Results

The former AS is located to the southeast of the current production area and is labeled Area 4 on Figure 4.1. The locations of Soil Borings advanced in and around the AS are presented on Figure 5.5. Soil Borings AS-1 and AS-2 were advanced along the estimated eastern and western boundaries of the former sump. Soil Boring AS-3 was advanced immediately southeast of the former sump boundary and represents the downgradient location, based on historic records. Samples were retained between 4 to 6 feet below grade. Analytical results from the Phase I investigation are presented on Table 5.13 for TCL organic parameters. Results of the TAL inorganic parameters are presented on Table 5.14.

The sample results were examined to evaluate if the results of Samples AS-1 and AS-2 characterized the nominal bottom of the former sump and if sample AS-3 represented the outside boundaries of the former sump.

Organic compounds (VOCs, SVOCs, and PCBs) were not detected in the samples. The volatile TICs were interpreted as unknowns with concentrations less than 2 mg/kg. The semivolatile TICs were interpreted as unknowns with a concentration of less than 0.5 mg/kg in samples AS-2 and AS-3. Semivolatile TICs were not detected in sample AS-1. The results from the TAL inorganic analyses occur at similar concentrations for all samples. As with the previous samples, both natural soil constituents and some heavy metals were identified.

The results of this sampling indicate that additional sampling for vertical and horizontal delineation would not be required in Phase II.

5.3.5 PCB Disposal Area Sampling Locations and Results

The investigation of the PDA was initiated in 1983 by Monsanto. A series of Soil Borings, B-1 to B-29 was conducted by Storch Engineering at intervals to 16 feet below ground surface. Soil samples were obtained at 2 foot intervals for PCB analyses. Isoconcentration maps, prepared by Roux Associates, Inc. for the RI Work Plan are presented in the previous section (Figure 4.3 to 4.11). These contour maps show PCB distributions at 2 foot depth intervals. They provided information defining vertical and horizontal extent of the PDA. Roux Associates, Inc. drilled two additional soil borings (PDA-1 and PDA-2) to a depth of 30 feet during the Phase I investigation for confirmation of the previous results (Figure 5.1).

PCB analytical results from Storch Engineering's investigation are provided on Table 4.1. The 29 soil borings were drilled to 16 feet below ground surface within the process area and former PDA. Results indicate the Samples B-1 to B-9 and B-24 to B-27 probably represent the former PDA and may define the horizontal extent of the former PDA. Most Storch Engineering soil boring samples were obtained at 2 foot intervals between 0 and 6 feet below ground surface. However, at Soil Borings B-24 to B-27 samples were analyzed between 0 and 16 feet below ground surface and provided information to define the vertical extent of the former PDA.

PCB concentrations within the former PDA were evaluated and elevated PCB concentrations were observed in the upper 10 feet of subsurface soil. A range of PCB concentrations for each depth interval is described below for the affected area.

Concentrations of PCBs in soils from samples taken at the 0 to 2 foot depth interval, ranged from 2,700 mg/kg (B-27) to 36,000 mg/kg (B-6). PCB concentrations between 2 to 4 foot interval ranged from 548 mg/kg (B-6) to 64,000 mg/kg (B-7). At the 4 to 6 foot interval, PCB concentrations ranged between 412 mg/kg (B-16) and 507,000 mg/kg (B-2A). Between the 6 to 8 foot interval, PCB concentrations ranged from 680 mg/kg (B-27) to 82,000 mg/kg (B-5). At the 8 to 10 foot interval, PCBs ranged from 97 mg/kg (B-24) to 5,400 mg/kg (B-26). PCBs ranged from 63 mg/kg (B-25) to 130 mg/kg (B-24) at the 10 to 12 foot interval. At 12 to 14 foot interval, PCB concentrations ranged from 250 mg/kg (B-27) to 1,400 (B-25). Between the 14 and 16 foot interval, PCB concentrations ranged from 50 mg/kg (B-26) to 16,500 mg/kg (B-25).

Roux Associates, Inc. soil borings were advanced to continue the vertical delineation of the Storch Engineering investigation. Samples were collected at two foot intervals between 16 and 30 feet below ground surface. The results are presented on Table 5.15 and described below. Soils sampled at the 18 to 30 foot intervals were composed of coarse sand and clay, and soils sampled between at the 16 to 18 foot interval were made up of peat and clay.

Soil Boring PDA-1 was drilled within the center of the PDA boundaries, to 30 feet. PCB concentrations at the 16 to 18 foot interval were 1,100 mg/kg. At the 18 to 20 foot interval PCBs totaled 6 mg/kg. Within the 20 and 22 foot interval, PCB concentrations were 52 mg/kg. At the 22 to 24 foot interval, PCBs concentrations were 100 mg/kg. PCB concentrations were 92 mg/kg, at the 24 to 26 foot interval. At the 26 to 28 foot interval, PCBs were 88 mg/kg, and at the 28 to 30 foot interval, PCBs were estimated at 32 mg/kg.

Soil Boring PDA-2 was drilled downgradient of the PDA boundaries to a depth of 30 feet and samples were obtained between 16 and 30 feet below ground surface. PCB concentrations at the 16 to 18 foot interval were 0.97 mg/kg. At the 18 to 20 foot interval PCBs totaled 6.5 mg/kg. Within the 20 and 22 foot interval, PCB concentrations were 7 mg/kg. At the 22 to

24 foot interval, PCBs concentrations were 17 mg/kg. PCB concentrations were 4 mg/kg, at the 24 to 26 foot interval. At the 26 to 28 foot interval, PCBs were 0.1 mg/kg, and at the 28 to 30 foot interval, PCBs were estimated at 0.5 mg/kg.

The results of the subsurface soils investigations within the PCB area indicate that the highest PCB concentrations occur within the upper 8 feet of soil, which is composed of unconsolidated fill and sand. Concentrations decreased with depth but increase at approximately 14 to 16 feet below ground surface, which occurs at the bottom of the peat and clay unit. The peat and clay unit provides some barrier to vertical movement of PCBs and other constituents, however some vertical movement through the peat layer may have been caused by vertical conduits created during previous subsurface investigations.

5.4 Phase II Subsurface Soil Sampling and Results

In the Phase II subsurface soils investigation, three targeted areas, APSS, SSP, and TSP, required additional soils investigation to complete the horizontal and vertical delineation. Seven soil borings were advanced to depths of 11 feet, the average depth of the peat and clay lithologic unit. The location of the Phase II Soil borings are described in the following sections.

Sample identification of the Phase II samples follows the same naming and numbering sequence as Phase I combining the soil boring location and depth interval. Parameters for sample analysis followed a reduced, Department approved list for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and PCBs. Samples were analyzed for BTEX using EPA Method 8020 and PCBs were analyzed by EPA Method 8080. The sampling QA/QC and equipment cleaning procedures which were used during Phase I were also followed in Phase II sampling (Section 5.1).

The soil borings were continuously split spoon sampled and lithologically logged by Roux Associates, Inc. Soils were also screened with an OVM. Samples obtained at depths described below, were sent to ENSECO East for analysis, via courier service. The sample results are presented in Tables 5.1 to 5.11 and are described below for each section. Isoconcentration maps, in Figures 5.6 to 5.19 present distributions of the parameters within the areas of concern.

5.4.1 Tertiary Settling Pond Soil Boring Locations and Results

One additional soil boring was drilled at the southeast corner of the former TSP. This soil boring was drilled, at the request of the Department, to characterize the location identified as a possible drainage inlet from the SSP. Soil Boring TSP-5 was located at the southeast corner of the former TSP. The location of the Phase I and Phase II soil borings are presented in Figure 5.2.

Soil Boring TSP-5 was advanced to approximately 11 feet below ground surface which was the average depth of the peat and clay lithologic unit. Soil samples were retained from the 4 to 6 foot interval to measure the estimated concentrations at the nominal bottom of the former settling pond. A second sample was retained at a 9 to 11 foot interval.

5.4.1.1 Tertiary Settling Pond Results

The TSP-546 result for BTEX analysis was 25 mg/kg. Toluene was quantitated at 18 mg/kg, ethylbenzene at 6 mg/kg, and total xylenes at 1 mg/kg. PCBs were identified in the sample as Aroclor 1248 at 1.3 mg/kg and Aroclor 1260 at 1.4 mg/kg. Total PCBs were 2.7 mg/kg.

The results for TSP-5911 were lower than those in TSP-546, indicating a reduction in concentrations with depth. In TSP-5911, BTEX, was detected at 2.5 mg/kg including 2 mg/kg of ethylbenzene and 0.5 mg/kg total xylenes. Total PCB concentrations of 2.1 mg/kg included 1.2 mg/kg of Aroclor 1248 and 0.9 of Aroclor 1260.

The extent of the TSP is smaller than originally estimated, as shown on isoconcentration maps (Figures 5.6 to 5.9). The potential concern is concentrated near the estimated in-take pipe, i.e., TSP-5. The soil concentrations are lower at the TSP than at the SSP and APSS, indicating that there may have been received less overflow from the TSP than had been originally estimated.

5.4.2 Secondary Settling Pond Soil Boring Locations

Four Phase II soil borings were drilled at the former SSP to continue the vertical and horizontal delineation. Soil Boring SSP-4 was located approximately 10 to 15 feet north of the Soil Boring SSP-3. Soil Boring SSP-5 was located 10 to 15 feet southwest of Soil Boring SSP-1. Soil Boring SSP-6 was located 10 to 15 feet south of the estimated downgradient boundary. Soil Boring SSP-7 was located between SSP-1 and SSP-3. Locations of the soil borings are presented in Figure 5.3.

Soil Borings SSP-4, SSP-5, and SSP-6 were advanced to approximately 11 feet below ground surface, the average depth of the peat and clay lithologic unit. Soil samples were obtained from the 4 to 6 foot interval to delineate concentrations at the estimated nominal bottom of the former SSP. A second soil boring sample was obtained at the 9 to 11 foot interval to delineate the vertical extent of the former SSP. Soil Boring SSP-7 was drilled to approximately 11 feet below ground surface. A sample was retained between 9 to 11 feet to characterize concentrations of target compounds vertically below the level of the pond bottom. The sample will provide information on vertical migration of compounds identified in Phase I from Samples SSP-1 and SSP-3.

5.4.2.2 Secondary Settling Pond Results

The Sample SSP-446 result for BTEX, totaled 4 mg/kg; consisting of approximately 3 mg/kg ethylbenzene and 1 mg/kg total xylenes. PCBs occurred at approximately 20 mg/kg, which included 3 mg/kg of Aroclor 1248 and 17 mg/kg of Aroclor 1260. Concentrations of BTEX and PCBs decreased with depth, as indicated by results of Sample SSP-4911. Only total xylenes of the BTEX group was identified at 0.8 mg/kg in Sample SSP-4911. PCBs at approximately 7.3 mg/kg included 0.6 mg/kg of Aroclor 1248 and 6.7 mg/kg of Aroclor 1260.

In Sample SSP-546, BTEX totaled 1.4 mg/kg, including toluene at 0.4 mg/kg, ethylbenzene at 0.8 mg/kg, and total xylenes at 0.2 mg/kg. The PCB concentration of 200 mg/kg consisted of Aroclor 1260. The concentrations of BTEX increased slightly while PCBs decreased at the 9 to 11 foot interval. In SSP-5911, BTEX occurred at 4.2 mg/kg, consisting of benzene at 0.3

mg/kg, ethylbenzene at 1.8 mg/kg, and total xylenes at 2.1 mg/kg. PCBs were identified at 6 mg/kg for Aroclor 1248 and 75 mg/kg for Aroclor 1260, with a total of 81 mg/kg PCBs.

For Sample SSP-646 BTEX was identified at 6.5 mg/kg, consisting of benzene at 0.3 mg/kg, toluene at 0.8 mg/kg, ethylbenzene at 3.2 mg/kg and total xylenes at 2.2 mg/kg. PCBs occurred at 55 mg/kg, including 41 mg/kg for Aroclor 1248 and 14 mg/kg for Aroclor 1260. For Sample SSP-646, BTEX was identified at 6.5 mg/kg, consisting of benzene at 0.3 mg/kg, toluene at 0.8 mg/kg, ethylbenzene at 3.2 mg/kg, and total xylenes at 2.2 mg/kg. PCBs occurred at 55 mg/kg, including 41 mg/kg for Aroclor 1248 and 14 mg/kg for Aroclor 1260. In Sample SSP-6911 concentrations of BTEX and PCBs decreased. The BTEX concentration of 4.2 mg/kg consisted of benzene (0.4 mg/kg), toluene (0.4 mg/kg), ethylbenzene (2.7 mg/kg) and total xylenes (0.9 mg/kg). PCBs were identified at 0.2 mg/kg for Aroclor 1248 and 0.5 mg/kg for Aroclor 1260, with a total of 0.7 mg/kg of PCBs.

Soil Boring SSP-7 was drilled between Soil Borings SSP-1 and SSP-3 (Phase I) to evaluate the potential vertical extent beneath the two borings. A sample was only collected at the 9 to 11 foot interval. The results of both BTEX compounds and PCBs are lower in Sample SSP-7911 than in Samples SSP-146 and SSP-346. In Sample SSP-7911, BTEX was 5.4 mg/kg consisting of benzene at 0.2 mg/kg, toluene at 3.8 mg/kg, ethylbenzene at 0.8 mg/kg, and total xylenes at 0.6 mg/kg. PCBs were identified at 1.5 mg/kg for Aroclor 1248 and 5.3 mg/kg for Aroclor 1260, totaling 6.8 mg/kg of PCBs.

Isoconcentration maps (Figures 5.10 to 5.13) have been prepared for the 4 to 6 and 9 to 11 foot depths. Results of Soil Boring E and F, from previous investigations, are included to estimate the extent of the settling pond boundaries. The results also show that the horizontal extent of the former area of concern is more extensive at the 4 to 6 foot depth i.e., the nominal bottom of the settling ponds, than at the 9 to 11 foot interval. The boundaries appear to be cone-shaped; decreasing with depth. Also, the delineation shows that the distribution of PCBs is greater than that of the volatile organic compounds.

5.4.3 AP/Sterox Sump Soil Boring Locations and Results

Three Phase II soil borings were drilled at the former APSS to continue to delineate the vertical and horizontal extent. Soil Boring APS-5 was located approximately 5 to 10 feet south of Soil Boring APS-2. Soil Boring APS-4 was located approximately 5 to 10 feet west of Soil Boring APS-1. Soil Boring APS-6 was located between Soil Borings APS-1 and APS-3. Locations of the original Phase I and proposed Phase II soil borings are presented on Figure 5.4.

Soil Borings APS-4 and APS-5 were advanced to approximately 11 feet below grade, which is the estimated depth of the peat and clay unit. Soil samples were obtained from the 4 to 6 foot interval to delineate concentrations of target compounds at the estimated nominal bottom of the former sump. A second sample was retained at the 9 to 11 foot interval to delineate the vertical extent of the former sump. The 4 to 6 foot sample results provided information of the horizontal and, to a limited extent, the vertical extent of the former sump.

Soil Boring APS-6 was advanced to approximately 11 feet below grade and a sample was retained between approximately 9 and 11 feet. This sample, located between Phase I Soil Boring APS-1 and APS-3, provides information on vertical migration of compounds identified during Phase I, in Samples SSP-1 and SSP-3.

5.4.3.1 AP/Sterox Sump Results

The APS-446 result for BTEX, totaled approximately 22 mg/kg, consisting of 17 mg/kg toluene, 3 mg/kg ethylbenzene, and 2 mg/kg total xylenes. PCBs occurred at 8.3 mg/kg consisting of 5.7 mg/kg of Aroclor 1248 and 2.6 mg/kg of Aroclor 1260. The concentrations of BTEX decreased with depth; however, PCBs occurred at the same concentrations. In Sample APS-4911, BTEX totalled approximately 4 mg/kg, including toluene at 3 mg/kg, ethylbenzene at 0.5 mg/kg, and total xylenes at 0.5 mg/kg. PCBs totalled 8.3 mg/kg, consisting of both Aroclor 1248 at 5.5 mg/kg and Aroclor 1260 at 2.8 mg/kg.

In Sample APS-546, BTEX totalled 4.2 mg/kg, consisting of 2 mg/kg toluene, 1.7 mg/kg ethylbenzene and 0.5 mg/kg total xylenes. PCBs totalled 111 mg/kg including 83 mg/kg of

Aroclor 1248 and 28 mg/kg of Aroclor 1260. Concentrations of BTEX and PCBs decreased at the 9 to 11 foot interval. BTEX was estimated at approximately 0.9 mg/kg toluene. PCBs totalled 1.9 mg/kg consisting of 1.4 mg/kg of Aroclor 1248 and 0.5 mg/kg of Aroclor 1260.

Soil Boring APS-6 was drilled between samples APS-1 and APS-2 (Phase I) to evaluate the potential vertical extent between the two boring locations. A sample was collected between the 9 to 11 foot interval. The results of BTEX are slightly higher in Sample APS-6911 than for Samples APS-146 (2.5 mg/kg) and APS-246 (ND). The results for PCBs are lower in Sample APS-6911 than for the corresponding Phase I samples, APS-146 (256 mg/kg) and APS-246 (708 mg/kg).

Isoconcentration maps (Figures 5.14 to 5.17) are presented for the 4 to 6 foot and 9 to 11 foot intervals. Where results for previous borings A, B, C, D, E, F, S-3, S-4, B-23, and B-29 were available, they were also used to estimate the extent of the former sump boundaries. The potential area of concern decreases from the 4 to 6 foot interval to the 9 to 11 foot interval. Also, the maps show that extent of PCB distribution is greater than that of BTEX.

5.4.4 Acid Sump

There were no additional Phase II subsurface soils investigations conducted within the Acid Sump area. Isoconcentration Maps were prepared for the 4 to 6 foot depth interval for Phase I soil borings (Figures 5.18 and 5.19).

5.5 Summary of Phase II Soil Boring Results

The locations of eight soil borings drilled in the Phase II subsurface sampling were selected to complete the horizontal and vertical delineation of three areas of concern, including the APSS, SSP, and TSP. Although previous results indicate the PDA as a potential area of concern, additional sampling was not conducted, because extensive previous sampling in this area provided estimates of the boundaries. Also, the AS was not sampled again, because the Phase I results indicated that additional sampling was not necessary.

The Phase II TSP sampling concentrated on the area in the southeast corner of the former settling pond that had been suspected as a pipe inlet from the SSP. One soil boring, sampled at 4 to 6 feet and 9 to 11 feet detected PCBs and VOCs in both samples, with lower concentrations at the 9 to 11 foot interval. The analytical results were lower in the samples from the TSP than from the SSP and AP/SS, suggesting that the overflow to the TSP may have been less frequent than first estimated.

At the SSP, four additional Phase II soil borings were drilled and samples were collected at 4 to 6 and 9 to 11 foot intervals. The PCB and VOC concentrations also decreased with depth. The results of soil borings E and F from previous investigations were used to interpret the extent of the former settling pond. The former sump may be larger and extend further to the west than originally estimated.

Three additional soil borings were drilled within and around the APSS. The PCB and VOC concentrations decrease with depth, as they did with both the TSP and SSP. The isoconcentration maps indicate a cone-shaped area of concern. The results of the Roux Associates, Inc, soil borings, and the results of several soil borings from previous site investigations (B-23, B-29, A, B, C, D, S-3, and S-4) were used to interpret the former sump boundaries. The actual sump boundaries of the APSS appear to extend further to the southeast than originally estimated.

5.6 Surface Soil Sampling and Analytical Procedures

At the request of the Department's Bureau of Environmental Evaluation and Risk Assessment (BEERA), 18 surface soil samples were obtained on May 22, 1990. The sampling was part of the Phase I soil sampling strategy. The Department requested additional surface soil sampling in Phase II of the investigation, with a reduced list of parameters and sampling location. The sampling procedures are presented below, followed by Phase I and Phase II sampling activities and results.

5.7 Phase I Surface Soil Sampling Locations, Procedures, and Results

The Phase I soil sampling locations were selected by the Department to target specific areas which included areas within the production and background locations as described below:

- Acid Sump (ACD),
- AP/Sterox Sump (APSS),
- Secondary Settling Pond (SSP),
- Tertiary Settling Pond (TSP),
- PCB Disposal Area (PDA)
- AP Structure or Building (APS),
- Sterox Structure (SSS), and
- Background Locations :
 - Well couplet 10S and 10D,
 - Well couplet 14S and 14D,
 - Former Well 2S, and
 - Well 16S.

Figure 5.20 presents the locations of these targeted surface soil sampling points. The soils near the PDA and fuel oil tank, APS, SSS, and APSS were of particular concern to the Department. This is because thin layers of free-phase, floating product had been observed in test pits near these locations during the OHM on-site investigation. A non-viscous floating product was reported by OHM in test pits near the APS, SSS, and APSS.

The surface soil sample designations, for example APS-SS-01 were assigned as follows: To identify the sampling area (APS); to distinguish the sample as a surface soil sample (SS); and to identify the specific sample location (01).

5.7.1 Surface Soil Sampling and Analytical Procedures

Surface soil samples were obtained beneath a gravel layer spread over the unpaved surfaces of the process area. Two samples were obtained at each targeted area and one sample was

obtained from each background location, where a thinner gravel layer occurred. The gravel layer was cleared away and soil was then composited and collected at a depth of 0 to 6 inches below the gravel layer. A sample for volatile organic analysis was subsequently collected at a 6 to 12 foot depth.

Samples were collected using pre-cleaned and wrapped stainless-steel trowels and spoons. The field equipment cleaning followed procedures outlined in the RI Work Plan, Addendum I, and Addendum II. QA/QC procedures were described earlier in this Section.

The samples were labeled and preserved as described in Section 5.1. The samples were sent via courier service to Enseco East Laboratory. Laboratory analysis included volatile organic compounds by USEPA Method 8240, semi-volatile organic compounds by USEPA Method 8270, PCBs by USEPA Method 8260, and inorganic metal and cyanide by USEPA SW-846 methods. The USEPA Contract Laboratory Program (CLP) list of parameters was analyzed by the above methods, as required by the Department.

5.7.2 Phase I Surface Soil Sampling Results

The analytical results of the surface soil samples are provided on Tables 5.17 to 5.21. The VOCs (Table 5.17) identified above the detection levels included acetone, ethylbenzene, tetrachloroethane, trichloroethene, toluene, and total xylenes. Acetone, detected in blanks, was subtracted from the sample results. VOCs were detected in APS-SS 01, from the APS; SSS-SS-01 and SSS-SS-02, from the SSS; and TSP-SS-01 from the former TSP.

Thirteen SVOCs (Table 5.18) identified above detection levels included anthracene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; butyl benzyl phthalate; chrysene; fluoranthene; phenanthrene; phenol; pyrene; and 1,2,4 trichlorobenzene. Bis (2-ethylhexyl) phthalate was identified in laboratory blanks and was subtracted from the sample result. SVOCs were identified in six samples including three samples from the background locations B02-SS-01, B10-SS-01, and B16-SS-01; two samples from the SSP, SSP-SS-01; SSP-SS-02; and sample TSP-SS-01, from the TSP.

PCBs (Table 5.17) were identified in every surface soil sample at ranges from 0.7 mg/kg in Sample B16-SS-01 to 2,500 mg/kg in Sample PDA-SS-01. PCBs were identified as Aroclor mixtures 1248 and 1260.

Inorganic parameters, including metals and cyanide (Table 5.19), were identified in all sampling locations and at similar concentrations. However, the results were highest for heavy metals such as arsenic, chromium, vanadium, and zinc within the process area.

The results of the identified organic compounds are discussed below for each sample. Also, the results of Tentatively Identified Compounds (TICs) from the library search (Tables 5.20 and 5.21) from the VOC and SVOC analyses are presented.

5.7.2.1 Surface Soil Sample Results - Acid Sump

Two surface soil samples were collected within and around the ACD. Sample ACD-SS-02 was collected within the estimated boundaries of the former sump; ACD-SS-01 was collected outside the boundaries. Only PCBs were detected in these samples. Total PCBs in Sample ACD-SS-01 were 5.3 mg/kg, consisting of 0.7 mg/kg of Aroclor 1248 and 4.6 mg/kg of Aroclor 1260. In Sample ACD-SS-02, PCBs were identified only as Aroclor 1260 at 4.2 mg/kg.

Volatile TICs identified in Sample ACD-SS-01 included an unknown at 0.1 mg/kg and in Sample ACD-SS-02 totaled 0.3 mg/kg for 1H-indene,2,3-dihydro-1,1,3. Semivolatile TICs in Sample ACD-SS-01 totalled 4 mg/kg, including heptachloro 1,1-biphenyl at 0.3 mg/kg, hexachloro 1,1-biphenyl at 0.2 mg/kg, sulfur, mol. (S8) at 0.2 mg/kg, and unknowns at 3.3 mg/kg. In Sample ACD-SS-02, SVOC TICs included 257 mg/kg of benzene substitutes and 57 mg/kg of unknowns for a total of 314 mg/kg.

5.7.2.2 Surface Soil Sample Results - AP/Sterox Sump

At the former APSS, Sample APSS-SS-02 was collected within the estimated boundaries of the former sump and Sample APSS-SS-01, was collected outside the sump boundaries. Only PCBs were detected. In sample APSS-SS-01, PCBs totaled 4.7 mg/kg, including 1.2 mg/kg of Aroclor

1248 and 3.5 mg/kg of Aroclor 1260. Total PCBs in Sample APSS-SS-02 were 159 mg/kg including Aroclor 1248 at 120 mg/kg and Aroclor 1260 at 39 mg/kg.

Volatile TICs identified in Sample APSS-SS-01 included 12.8 mg/kg including C-10 hydrocarbons, C-9 hydrocarbons, and 6 mg/kg of unknowns. In Sample APSS-SS-02, 6 mg/kg of unknowns were estimated. Semivolatile TICs identified in Sample APSS-SS-01 totalled 123 mg/kg of unknowns. In Sample APSS-SS-02, 21 mg/kg of pentachloro, 1,1-biphenyl, 15 mg/kg tetrachloro, 1,1-biphenyl, and 378 mg/kg unknown acid ester, and 1,524 mg/kg of unknowns were identified.

5.7.2.3 Surface Soil Sample Results - Secondary Settling Pond

Sample SSP-SS-02 was collected within the boundary of the former SSP and Sample SSP-SS-01 was collected outside the estimated boundary. Both SVOCs and PCBs were detected in these samples. In Sample SSP-SS-01, phenol was the only SVOC identified at 2.8 mg/kg. PCB Aroclor 1260 was detected at 16 mg/kg. In Sample SSP-SS-02, SVOCs 1,2,4 trichlorobenzene 1.3 mg/kg, chrysene at 0.7 mg/kg, and phenanthrene at 0.9 mg/kg, were detected. PCB Aroclor 1260 was detected at 85 mg/kg.

Volatile TICs were estimated at 0.1 mg/kg of unknowns in Sample SSP-SS-01 and 1.5 mg/kg of unknowns in SSP-SS-02. Semivolatile TICs from Sample SSP-SS-01 totaled 70 mg/kg, including, unknowns at 54 mg/kg, C-1 benzene at 1 mg/kg, heptachloro, 1,1-biphenyl at 4 mg/kg, hexachloro, 1,1-biphenyl at 5 mg/kg, hydrocarbon at 3 mg/kg, sulfur, mol.(S8) at 2.3 mg/kg and unknown acid esters at 1 mg/kg. In Sample SSP-SS-02, total semivolatile TICs included 88.5 mg/kg, consisting of unknowns at 54 mg/kg, bimethyl naphthalene at 1.2 mg/kg, heptachloro, 1,1-biphenyl at 9.4 mg/kg, hexachloro, 1,1-biphenyl at 11.7 mg/kg, hydrocarbon at 6.4 mg/kg, octachloro, 1,1-biphenyl at 2 mg/kg, and tetrachlorobenzene at 3.5 mg/kg.

5.7.2.4 Surface Soil Sample Results - Tertiary Settling Pond

At the TSP 2 samples were collected within the boundaries of the former settling pond. VOCs, SVOCs, and PCBs were detected in Sample TSP-SS-01. The VOC tetrachloroethane was

detected at 0.03 mg/kg and trichloroethane was identified at 0.01 mg/kg. The SVOC benzo(b)fluoranthene was detected at 1.7 mg/kg. Total PCBs were 15.5 mg/kg, including 7.5 mg/kg Aroclor 1248 and 8 mg/kg Aroclor 1260.

Volatile TICs in sample TSP-SS-01 totalled 0.1 mg/kg for C-14 H-20 0-2 Isomer. In sample TSP-SS-02, 0.4 mg/kg of unknowns were estimated. Semivolatile TICs in Sample TSP-SS-01 totalled 50.3 mg/kg, consisting of unknowns at 41 mg/kg, 4-nonyl phenol at 3 mg/kg, C-15 and C-20 isomers at 2 mg/kg, and unknown acid esters at 4 mg/kg. In TSP-SS-02 763 mg/kg of unknowns were identified.

5.7.2.5 Surface Soil Sample Results - PCB Disposal Area

Two samples were collected within the area of the former PDA. Sample PDA-SS-01 was collected within the area of the boundaries. Sample PDA-SS-02 and duplicate Sample PDA-SS-03 were collected near the PDA boundary. Only PCBs were detected.

Total PCBs for Sample PDA-SS-01 was 2,500 mg/kg, consisting only of Aroclor 1248. PCB concentrations in Sample PDA-SS-02 were 2.5 mg/kg, consisting of Aroclor 1248 at 1.6 mg/kg and Aroclor 1260 at 0.9 mg/kg. In Sample PDA-SS-03 Aroclor 1248 was detected at 1.7 mg/kg.

Volatile TICs in Sample PDA-SS-01 totalled 20 mg/kg, consisting of 17 mg/kg unknowns and 3 mg/kg dimethyl naphthalene isomer. In Sample PDA-SS-02 and Sample PDA-SS-03, 0.1 mg/kg were estimated as unknowns. Semivolatile TICs were estimated at 2,207 mg/kg in Sample PDA-SS-01, including 1,551 mg/kg of tetrachloro,1,1-biphenyl, 514 mg/kg of pentachloro,1,1-biphenyl and 42 mg/kg of hexachloro 1,1-biphenyl. In Sample PDA-SS-02 108 mg/kg of semivolatile TICs were estimated, including 1H-indene, 2,3-dihydro-1,1,3, at 55 mg/kg, 4-(1,1,3,3-tetramethylbutyl)-phenol at 5 mg/kg, C-20 isomer at 2 mg/kg, unknown acid esters (4 mg/kg), other unknowns at 42 mg/kg. Semivolatile TICs in Sample PDA-SS-03 totalled 177 mg/kg, including butyl 1,2-benzenedicarboxylic acid (6.6 mg/kg), C-3 benzene (6 mg/kg), nonyl phenol (3 mg/kg), and unknowns (161 mg/kg).

5.7.2.6 Surface Soil Sample Results - AP/Sterox Structure

Two samples were collected within the area of the APS, Sample APS-SS-01 and Sample APS-SS-02. In sample APS-SS-01, VOCs and PCBs were detected. The VOCs included toluene at 71 mg/kg and xylenes at 17 mg/kg. PCB Aroclor 1248 was identified at 6.4 mg/kg. In Sample APS-SS-02 only PCBs were detected at 32 mg/kg in Sample APS-SS-01.

Volatile TICs for Sample APS-SS-01 totalled 7,071 mg/kg, including 4,691 mg/kg unknowns, 2,100 mg/kg of C-10 hydrocarbon isomer, and 280 mg/kg of C-14 H-20 O-2 isomer. In Sample APS-SS-01, volatile TICs totalled 517 mg/kg including 502 mg/kg of unknowns and 15 mg/kg of C-14 H-20 O-2 isomer. Semivolatile TICs for Sample APS-SS-01 totalled 2,360 mg/kg, including 1,487 mg/kg of unknowns, 128 mg/kg of unknown acid esters, 85 mg/kg of C-4 benzene, 68 mg/kg of C-3 benzene, 310 mg/kg of 4-nonyl phenol, 230 mg/kg of 4-(1,1,3,3-tetramethylbutyl)-phenol, and 52 mg/kg of 4-(1-methyl-1-phenylethyl)-phenol. In Sample APS-SS-01, 10,516 mg/kg of semivolatile TICs were identified, including 7146 mg/kg of unknowns, 720 mg/kg of unknown acid esters, 2,140 mg/kg of nonyl phenol and 510 mg/kg of 4-(1,1,3,3-tetramethylbutyl)-phenol.

5.7.2.7 Surface Soil Sample Results - Sterox Structure

Two samples were collected within the area of the Sterox Structure, Sample SSS-SS-01 and Sample SSS-SS-02. In both samples, VOCs and PCBs were detected. In Sample SSS-SS-01 the VOC ethylbenzene was identified at 1.2 mg/kg. PCBs totaled 2.4 mg/kg., including 1.3 mg/kg of Aroclor 1248 and 1 mg/kg of Aroclor 1260. In Sample SSS-SS-02 toluene was detected at 0.13 mg/kg. PCBs total 2.8 mg/kg, including 1.7 mg/kg Aroclor 1248 and 1.1 mg/kg Aroclor 1260.

Volatile TICs at the Sterox Structure for Sample SSS-SS-01 included 110 mg/kg of C-3 benzene, 12 mg/kg of C-4 benzene, 8 mg/kg of C-9 hydrocarbon isomer, and 25 mg/kg of unknowns. The total was 155 mg/kg total volatile TICs. In Sample SSS-SS-02, the volatile TICs totaled 5 mg/kg of unknowns. The semivolatile TICs for Sample SSS-SS-01 were estimated at 25 mg/kg, including 20 mg/kg of unknowns, 1 mg/kg of unknown acid ester, 2 mg/kg of 4-phenyl-

bicyclohexyl, and 2 mg/kg of dodecyl phenol. The estimated total for Sample SSS-SS-02 was 3,230 mg/kg of unknown semivolatile TICs.

5.7.2.8 Surface Soil Sample Results - Background Samples

The four background samples are designated B02-SS-01, B10-SS-01, B14-SS-01, and B16-SS-01. VOCs were not identified in the background samples. SVOCs were identified in Samples B02-SS-01, B10-SS-01, and B16-SS-01. PCBs were identified in all four background samples. The analytical results are described below.

In Sample B02-SS-01, the SVOCs butyl benzyl phthalate and fluoranthene were each identified at 1 mg/kg, for a total of 2 mg/kg. Aroclor 1260 was identified at 3.6 mg/kg. Volatile TICs totalled 2.3 mg/kg including butylheptylbenzene and unknowns. Semivolatile TICs totalled 9 mg/kg including unknowns, hydrocarbons, and C-20 H-12 isomers.

In Sample B10-SS-01, there were approximately 47.5 mg/kg of total SVOCs, including benzo(a)anthracene at 7 mg/kg, benzo(a)pyrene at 8 mg/kg, benzo(b)fluoranthene at 10 mg/kg, benzo(g,h,i)perylene at 4.5 mg/kg, chrysene at 7 mg/kg, fluoranthene at 1 mg/kg and pyrene at 10 mg/kg. Total PCBs in Sample B10-SS-01 were 6.7 mg/kg including, 1.4 mg/kg of Aroclor 1248 and 5.3 mg/kg of Aroclor 1260. Volatile TICs were not detected. Semivolatile TICs totalling 27 mg/kg included 10 mg/kg of unknowns, 11 mg/kg of substituted benzenes, and 6 mg/kg of C-20 H-12 isomers.

In Sample B14-SS-01, total PCBs were 99 mg/kg, including Aroclor 1248 at 79 mg/kg and Aroclor 1260 at 20 mg/kg. Volatile TICs were not detected. Semivolatile TICs included 7,267 mg/kg of unknowns and 1,100 mg/kg of 4-nonyl phenol.

In sample B16-SS-01, SVOCs totaled 27 mg/kg, including anthracene at 2 mg/kg, benzo(a)anthracene at 2.5 mg/kg, benzo(a)fluoranthene at 4 mg/kg, benzo(g,h,i)perylene at 1 mg/kg, chrysene at 2.5 mg/kg, fluoranthene at 6 mg/kg, benzo(a)pyrene at 2 mg/kg, phenanthrene at 3 mg/kg, and pyrene at 4.5 mg/kg. Aroclor 1248 totalled 0.7 mg/kg. Volatile TICs were not detected. Semivolatile TICs totalled 12 mg/kg, including C-20 H-12 isomer at

1.5 mg/kg, hydrocarbon at 2.5 mg/kg, sulfur, mol. (S8) at 2.5 mg/kg, and unknowns at 5.3 mg/kg.

5.7.3 Summary and Recommendations from the Phase I Surface Soil Sampling

The Phase I surface soil results were presented to the Department in the Draft Phase I of Phase II Remedial Investigation Report, October 1990. The Department directed additional surface soil sampling in their April 1, 1991 response comments to the Remedial Investigation Work Plan Addendum II, March 1991 at locations B10-SS-01 and B16-SS-01 for the polycyclic aromatic hydrocarbons (PAHs).

The Department had expressed specific concern for a list of potentially carcinogenic PAHs, e.g., CaPAHs, described in the ICF Clement, Inc. (1988) report prepared for USEPA. This document lists both priority and non-priority pollutants described as CaPAHs. The priority pollutants listed in the report include benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)anthracene, benzo(k)fluoranthene, dibenz(a,h)anthracene, chrysene, and indeno(1,2,3-cd)pyrene. Most of these compounds were identified in the semivolatile analyses of surface soil samples. None of the non-priority pollutants listed in the report were identified in the library search.

The Department required additional sampling and analysis where the total CaPAHs exceeded 10 mg/kg in Phase I. The sampling and analysis of these samples (B10 and B16) is presented in Section 5.8.

5.8 Phase II Surface Soil Sampling Results

The Phase II surface soil sampling at B10-SS-02 and B16-SS-02, followed the same procedures and protocol as the Phase I sampling. The sampling took place on March 21, 1991. At location B16-SS-02, a duplicate sample was taken and labeled B03-SS-02. It was sent to the laboratory as a blind field duplicate. The laboratory, Enseco East, analyzed the samples by USEPA Method 8270 for semivolatile analysis, with a modified list of parameters, including only PAHs.

The results of the sample are presented on Table 5.22. The table also presents total concentrations of PAH, and CaPAHs.

5.8.1 Results for Sample B-10 and B-16

In Sample B10-SS-02 the total PAHs were 9 mg/kg, which included only CaPAH, chrysene. Therefore, there were 9 mg/kg CaPAH. In the Phase I sample at this location, there had been 14 mg/kg CaPAHs at this location and had included benzo(a)pyrene at 7 mg/kg, benzo(b)fluoranthene at 10 mg/kg, and chrysene at 7 mg/kg. The identification of total CaPAHs is similar; however the parameters differed. This is probably due to the nonhomogeneous nature of the soil and to the variable ambient conditions which are a possible source of the PAHs at these background locations.

In Sample B16-SS-02 total PAHs were 32 mg/kg with 15 mg/kg of CaPAHs, including benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and chrysene. In the Phase I sample at this location, only benzo(a)pyrene had been detected above the detection level at 5.5 mg/kg. Other CaPAHs had been estimated below the detection level. Variability of analytical results appears to be due to homogeneity of soils and ambient conditions.

The duplicate of Sample B16-SS-02, e.g. B03-SS-02, had 116 mg/kg of total PAHs. Of this total, there were 85 mg/kg of CaPAHs identified. There is a 114 percent difference (%D) between the result of the total PAH analyses for samples B16 and duplicate sample B03. Also, there is a 140 percent difference between the results for the CaPAH parameters in the duplicate sample. These differences may substantiate the observation that the soils are not homogeneous.

6.0 GROUND-WATER INVESTIGATION

To characterize the ground water for the Kearny Monsanto site a comprehensive hydrogeologic study was performed. The study was designed from Roux Associates, Inc.'s review of previous hydrogeologic investigations, well logs from neighboring sites, and references on regional geology and hydrogeology.

The components of the hydrogeologic assessment for the remedial site investigation were outlined in the RI Work Plan, Addendum I and II and are highlighted below:

- Ground-Water Monitoring Well Installation,
- Ground-Water Monitoring Well Abandonment,
- Monitoring Well Elevations Survey Relative to Mean Sea Level,
- Evaluation of Site Geology and Hydrogeology,
- Observation Point Installation,
- Separate-Phase Organics Delineation in Ground Water,
- Ground-Water Level Elevation Measurement and Evaluation,
- Water-Bearing Zone Recovery Tests,
- Seasonal and Tidal Fluctuations of Ground-Water Elevations, and
- Ground-Water Quality Evaluation and Compounds Delineation in Ground Water.

The activities conducted for the hydrogeologic assessment and the results are presented in the following section.

6.1 Ground-Water Monitoring Well Installation and Abandonment

To obtain information on site hydrogeology, ground-water monitoring wells were installed at selected locations on the site to provide data on ground-water constituents and characteristics. Some of the pre-existing wells used in previous investigations (see Section 4) were sampled during this investigation. Other pre-existing wells were abandoned due to unsuitable well integrity or condition. Roux Associates, Inc. installed additional wells to replace abandoned wells and to expand the ground-water monitoring network. The following discussion presents

information on wells retained from previous site investigations, and wells abandoned and installed during this investigation.

6.1.1 Historic Well Installation and Abandonment

The construction design and monitoring results for the wells retained from previous site investigations were discussed in Section 4. The following section describes the wells which were retained or abandoned. The well locations were presented on Figure 4.2.

Monsanto conducted previous hydrogeologic investigations at the Kearny Plant beginning in 1983. HP Drilling, Inc., a New Jersey-certified well driller, was contracted by Monsanto to install eight shallow ground-water monitoring wells (MW). The wells were drilled in the upper water-bearing zone to a maximum depth of 18 feet below ground surface and designated MW-1S through MW-8S, with the S indicating shallow depth. Four wells, MW-1S, MW-4S, MW-5S, and MW-6S were installed at the northern site boundary, along an east-west transect. MW-3S was installed east of the Sterox tanks, MW-7S was installed adjacent to the southeast corner of the large western tank dike, and MW-2 was installed approximately 200 feet north of the guard house at the entrance to the facility, and subsequently abandoned in 1990. MW-8S was installed south of the process area on the edge of the Passaic River.

In 1984 nine additional ground-water monitoring wells were installed by O.H. Materials of Findlay, Ohio, a New Jersey certified well driller. Ground-water monitoring well couplets, MW-9D and MW-9S, MW-10D and MW-10S, MW-11D and MW-11S, MW-12D and MW-12S were installed. The deep (D) wells were drilled to approximately 30 feet below ground surface, with the D designating deep wells. The paired shallow (S) wells were installed to approximately 10 to 12 feet below ground surface. An additional deep well, MW-3D, was installed adjacent to the existing shallow well MW-3S. These well locations were probably selected to monitor site hydrogeologic conditions beneath the process area and at an upgradient and downgradient point.

6.1.2 Roux Associates Inc. Well Installation and Abandonment

To perform an evaluation of ground-water quality and hydrogeology, Roux Associates, Inc. identified pre-existing wells to be retained and selected additional locations for well installation. Fourteen new ground-water monitoring wells were installed in May 1990 by a New Jersey licensed well driller from Empire Soils Investigations, Inc. under the supervision of a geologist from Roux Associates, Inc. Well locations are presented on Figure 6.1. Ten deep wells (with D designations) were installed to evaluate the lower water-bearing zone and four shallow wells (with S designations) were installed to evaluate the upper water-bearing zone. Three well couplets (MW-13S and MW-13D, MW-14S and MW-14D, MW-15S and MW-15D) were installed downgradient of the process area and potential areas of concern. Monitoring well couplet MW-13S and MW-13D is located southwest of the former TSP; monitoring well couplet MW-14S and MW-14D is south-southwest of the production area and west of the warehouse; and monitoring well couplet MW-15S and MW-15D is located west of the former AS.

Three additional deep monitoring wells, MW-6D, MW-7D, and MW-8D were drilled adjacent to existing shallow monitoring wells, creating three new monitoring well couplets. Monitoring well MW-7D is located southwest of the process area. The location of MW-8D was selected to monitor the lower water-bearing zone as it discharges to the Passaic River. MW-6D, northwest of the TSP, serves to provide some background information on ground-water quality of the lower water-bearing zone. One shallow monitoring well, MW-16S, was installed in the northwest corner of the facility, at a background location.

Five existing wells from previous investigations, MW-9D, MW-10D, MW-11D, MW-12D, MW-2, were abandoned at the Department's request. These monitoring wells had penetrated the confining unit of peat and clay, and had been installed without adequate grout or double casings. The pre-existing wells were abandoned by overdrilling, removing the steel and polyvinyl chloride (PVC) casing, and sealing the boreholes with grout, according to Department requirements for well abandonment. The wells were replaced (except MW-2) with deep, double-cased monitoring wells, as described below.

Well Installation

The new wells installed during the site investigation were continuously split-spoon sampled and lithologically logged by a Roux Associates, Inc. geologist. Split-spoon samples and drill cuttings were screened for the presence of volatile organic vapors using a photoionization detector. Copies of geologic logs for each monitoring well boring can be found in Appendix A. The wells were completed with at least 2 feet of protective steel casing extending above grade, except for MW-9D, MW-15S and MW-15D, which were flush mounted at the ground surface. The wells were equipped with a locking cap. Existing wells on site were developed after new well installation activities were completed. The well installation varied for deep and shallow well installation, as described below.

Upper Water-Bearing Zone

Shallow ground-water monitoring wells (MW-13S, MW-14S, MW-15S and MW-16S) were installed in accordance with the Department's specifications for unconsolidated monitoring wells (Appendix B-1). An 8-inch, outer diameter, hollow-stem auger was used to install each shallow monitoring well. The shallow well borings were drilled to a depth of 10 to 15 feet below ground surface without breaching the confining peat and clay unit. The shallow wells were completed using a 4-inch diameter, Schedule 40, PVC casing with 0.020-inch slotted well screen. The lengths of well screens vary from 7 to 10 feet due to variations in the depth to the top of the peat and clay confining unit. The well screens in the shallow wells did not bridge the water table, as will be explained in Section 6.3. Construction details for each shallow monitoring well installed under the supervision of Roux Associates, Inc. are presented in Appendix C.

Lower Water-Bearing Zone

A total of 10 deep ground-water monitoring wells were installed in accordance with the Department's monitoring well specifications for confined, unconsolidated, water-bearing zones (Appendix B-2). A mud-rotary drilling method was used to install the deep ground-water monitoring wells (MW-8D, MW-9D, MW-13D, MW-14D, and MW-15D) to stabilize the

boreholes. The drilling mud stabilizes and prevents the collapse of sands into the borehole. Five wells (MW-7D, MW-6D, MW-10D, MW-11D, and MW-12D) were installed using a combination of hollow-stem auger and mud-rotary drilling techniques.

After each borehole was advanced to the peat and clay layer, an 8-inch, outer diameter steel casing was driven 1 to 3 feet into the confining unit. The steel casings were grouted and allowed to set overnight and then drilled through the peat and clay confining unit. A 4-inch diameter, Schedule 40, PVC inner casing with 10 feet of 0.020-inch slotted well screen was installed through the outer steel casing, into the lower water-bearing unit, to depths ranging between 26 and 30 feet below ground surface. Construction details for each deep ground-water monitoring well installed under the supervision of Roux Associates, Inc. are presented in Appendix D.

6.1.3 Monitoring Wells Survey

On August 22, 23, and 29, 1990 the monitoring wells were surveyed relative to mean sea level. The top of the inner PVC casing (excluding the cap), top of outer steel protective casing, and ground surface adjacent to the well were surveyed to the nearest hundredth foot (± 0.01 foot) by Robert W. Ent, a New Jersey-licensed surveyor. Points on top of the steel and PVC casings were marked for future ground-water elevation measurements. Copies of the Department's monitoring well certification Forms A and B for each well are presented in Appendix E.

6.2 Site Geology and Hydrogeology

6.2.1 Site Geology

Subsurface investigations conducted to date by Monsanto and Roux Associates, Inc. have indicated the presence of at least four distinct geologic units beneath the site. Multiple borings were drilled and logs prepared to characterize the stratigraphy of the unconsolidated sediments below the site. Geologic literature shows that the site stratigraphy is typical for the area. Site-specific geologic cross sections are provided in Figures 6.2 to 6.4. Geologic logs of well borings and soil borings are presented in Appendix A.

The four stratigraphic units are described as follows:

- The first unit consists of 2 to 7 feet of fill material, underlain by silty medium to coarse sand with gravel. From the surface of the site, the first unit ranges in thickness between 7 and 10 feet. This unit is thinnest adjacent to the Passaic River located on the southwest boundary of the site and is thickest in the central part of the site.
- The second stratigraphic unit consists of peat and clay. It begins at an average depth of 12 feet below ground surface. This unit ranges in thickness between 5 and 8 feet. It is thickest adjacent to the Passaic River. It has a very low permeability and is considered a confining unit. Prior to the time this site was reclaimed for industrial use, this may have been the original ground surface.
- The third stratigraphic unit consists of coarse sand with some silt and gravel. It begins at an average depth of 18 feet below ground surface. This unit has an average thickness of approximately 10 feet across the site and is thickest on the eastern portion of the site.
- The fourth stratigraphic unit, encountered at approximately 28 feet below ground surface, consists of alternating silt and clay laminations which form thin light and dark colored bands. This stratified deposit is typical of sediments deposited by glacial meltwater in lakes (glacio-lacustrine deposits) during the end of the Pleistocene Ice Age. Review of well records of ground-water wells within 1 mile of the site and regional geologic literature indicates that the thickness of this Pleistocene age lacustrine clay varies from 30 to 50 feet. This unit has a very low permeability and is considered a hydraulic barrier between the recent fluvial sediments and Triassic age bedrock.

6.2.2 Site Hydrogeology

Hydrogeologic and subsurface investigations conducted by Monsanto and Roux Associates, Inc. have indicated the presence of two water-bearing zones within the upper 30 feet of sediment, separated by a continuous, confining unit of peat and clay. A relatively impermeable boundary of silt and clay lies below the two water-bearing zones.

The water-bearing zones are not sources of drinking water due to the shallow depth to the upper water-bearing zone and the saline characteristics of the lower water-bearing zone. Both water-bearing zones discharge to the Passaic River, which is tidally influenced, fluctuating within a few feet of mean sea level.

The upper water-bearing zone occurs within the first lithologic unit of fill material and coarse sand. It is a partially saturated and unconfined water-bearing zone. The water table occurs between 2 to 4 feet below ground surface. In the upper water-bearing zone a tidal influence has been observed during high tides.

The lower water-bearing zone occurs within the third lithologic unit consisting of coarse sand with some silt and gravel. The unit is completely saturated with water and confined between two semi-permeable lithologic units. The static head rises above the overlying peat and clay unit, which separates the upper and lower water-bearing zones. A distinct tidal influence was observed from continuous water-level measurements. Furthermore, ground-water chemistry shows elevated concentration of constituents of saline water.

6.3 Observation Points for Monitoring Floating Product

To delineate the extent of the free-phase, floating product observed during previous test pit investigations within the production area, observation points bridging the water table of the upper water-bearing zone were installed. The observation points will be used only to characterize floating, free-phase product.

The observation points were required in addition to monitoring wells in order to bridge the water table. The monitoring wells were constructed with screens below the water table to adhere to the Department's rules on well installation. Therefore, the Department authorized the installation of observation points bridging the water table to measure free-phase floating product.

Nine observation points were installed as described in the following table. Figure 6.5 provides the point locations.

| Observation Point # | Area of Concern to be Monitored |
|---------------------|---------------------------------------------------------------------------|
| OB-A | Secondary Settling Pond (SSP) |
| OB-B | Nonene/Phenol Tank Farm and AP in-process tanks |
| OB-C | Former location of PCB storage tank and existing AP structure (destroyed) |
| OB-D | AP structure/Sterox structure |
| OB-E | AP storage tanks |
| OB-7 | SSP, Nonene/Phenol Tank Farm, MW-7S |
| OB-9 | Fuel oil tank and PCB disposal area |
| OB-11 | AP in-process tanks and MW-11S and 11D |
| OB-12 | Sterox structure and MW-12S and 12D |

The observation points were installed to approximately 6 feet below ground surface with a 4-inch, hollow-stem auger and constructed of 2-inch diameter, Schedule 40, PVC, 0.02-inch slotted well screen. The observation points will be abandoned after the delineation of the floating product. Results of the observation point gauging are below.

6.3.1 Delineation of Separate Phase Floating Product

Each observation point was periodically gauged to monitor for the presence of free-phase floating product. Table 6.1 summarizes the results of each gauging event. Floating product was detected only in observation point OB-9, located next to the aboveground fuel oil tank and the product volume was insufficient to collect for analysis. Separate-phase product was observed in OB-A and OB-D in June 1990, and in OB-D during August and September 1990; oil sheens were not observed in the observation points after September 1990.

6.4 Ground-Water Elevation Measurements

Ground-water levels were measured prior to each ground-water sampling event. Additionally, water-level measurements were obtained during surveying and prior to the initiation of the tidal influence study. An electronic water-level probe was used to measure the depth to water from the surveyed measuring points in wells during each sampling event. The elevation measurements were converted to values relative to mean sea level. These measurements provided data to

calculate ground-water elevations. These measurements were subsequently used to determine the direction of ground-water flow.

The 15 monitoring wells in the upper water-bearing zone were gauged in June, August, September, December, 1990 and March, 1991. The eleven lower water-bearing zone monitoring wells were gauged on June, August, September, and December, 1990, and April, 1991. The ground-water elevations were subsequently used to determine ground-water flow directions and hydraulic gradients in both water-bearing zones for each gauging event. Also, vertical potential gradient between the two water-bearing zones was estimated.

6.4.1 Ground-Water Elevation Measurement Results

Ground-water elevation measurements from monitoring wells are presented in Tables 6.2a and 6.2b for the upper and lower water-bearing zones, respectively. Well Monitoring Logs for each gauging event are presented in Appendix F.

Upper Water-Bearing Zone

Water-level measurements were collected for the upper water-bearing zone in June, August, September, and December 1990 and March 1991. Ground-water level elevation contour maps, presented in Figures 6.6 through 6.10, were constructed for each gauging event using the data provided in Table 6.2a.

The contour maps indicate that ground-water flow direction in the upper water-bearing zone is from the northeast to the southwest with discharge to the Passaic River. During periods of high precipitation and correspondingly high ground-water elevation, a "mounding" effect was observed within the active process area. This mounding effect causes local variations in flow patterns within the upper water-bearing zone. These variations in flow may be controlled by several factors including the heterogeneity of the fill material, irregular rainfall infiltration, and surface ponding.

Hydraulic gradients within the upper water-bearing zone vary across the site. Hydraulic gradients are steepest within 50 feet of the Passaic River and are relatively low throughout the remainder of the site. Based on the water level elevation maps in Figures 6.6 through 6.1.0, hydraulic gradients in the vicinity of the Passaic River are generally approximately 0.05 feet per foot. Hydraulic gradients throughout the remainder of the site are generally approximately 0.004 feet per foot.

The hydraulic gradient of the upper water-bearing zone was calculated for each ground-water level gauging event from areas of high ground-water levels to areas of low ground-water levels:

Lower Water-Bearing Zone

Water-level measurements were collected for the lower water-bearing zone in June, August, September, and December 1990 and on April 1991. Ground-water level elevation contour maps, presented in Figures 6.11 through 6.15, were constructed for each gauging event using the data provided in Table 6.2b. The contour maps indicate that ground-water in the lower water-bearing zone flows from the northeast to the southwest, toward the Passaic River.

A plot of water level elevations versus distance from the river is shown in Figure 6.16 for monitoring wells MW-10D, MW-11D, and MW-13D. The water level elevations in Figure 6.16 were collected on August 30, 1990 at high tide and low tide during the midday tidal cycle. The data is contained in Appendix G and is summarized in Table 6.3.

As shown in Figure 6.16, the water level surface is highest during high tide and lowest during low tide. Hydraulic gradients are greatest near the river and decrease with increasing distances from the river. Based on the plots in Figure 6.16, hydraulic gradients near the river are generally up to 0.01 feet per foot, whereas the gradients in the central part of the site are generally less than 0.001 feet per foot.

6.5 Seasonal Water-Level Fluctuation Study

A long-term periodic study was conducted to evaluate seasonal ground-water levels. Water levels were continuously monitored with pressure transducers and daily averages were determined. Monitoring occurred during three seasonal study periods of approximately one month, including Fall (August 29 to September 30, 1990), Winter (December 18, 1990 to January 28, 1991), and Spring (April 6 to May 5, 1991). Additionally, rainfall records for these periods were compared to water-level measurements to identify possible relationships between them.

6.5.1 Methods for Seasonal Water-Level Fluctuation Study

Monitoring well couplet MW-11S and MW-11D was chosen for this study because of its central on-site location. The initial water-level was determined manually at the beginning of each seasonal monitoring period to provide a baseline elevation. Subsequent water-level measurements, using the pressure transducers, were automatically recorded at 10 minute intervals. These measurements were averaged every 2 to 4 hours to provide the water-level data. The data is presented in Appendix J and graphs of the water-level data are presented in Figures 6.17 to 6.22, along with rainfall data. Rainfall data for the area was obtained from the Newark International Airport.

6.5.2 Results of the Seasonal Water-Level Fluctuation Study

As shown by the graphs in Appendix H, water level fluctuations were observed in both the upper water bearing zone and lower water bearing zone. Each of the graphs show long term seasonal trends and shorter term fluctuations. Short term fluctuations in the upper water bearing zone are generally correlated with precipitation events. Short term fluctuations in the lower water bearing zone are due to tidal effects. A correlation between water level fluctuations and precipitation events was not observed for the lower water bearing zone. Fluctuations due to the tides obscures any precipitation effects which may be present.

In the upper water-bearing zone, the maximum water level, 7.23 feet, occurs on April 21 and the minimum water-level, 5.99 feet, occurs on September 30. In the lower water-bearing zone, the maximum water-level, 2.96 feet, occurs on April 21 and the minimum water-level, 1.57 feet, occurs on April 11.

During the fall study period, water-levels in both MW-11S and MW-11D decline overall. The water-level in MW-11S declines from 7.15 feet on August 20 to 5.99 feet on September 30. The water-level in MW-11D declines from 2.54 feet on August 29 to 1.97 feet on September 30.

Winter ground-water levels show the least variability. The ground-water level in MW-11S is 6.37 feet on December 18 and increases to a seasonal maximum of 7.07 feet on January 17. It then decreases gradually to 6.15 feet on January 28. The water level in MW-11D is 2.09 feet on December 18 and gradually increases through the winter monitoring period to a seasonal maximum of 2.64 feet on January 16. The water-level then decreases to 1.91 feet on January 28.

During the spring monitoring period, the water-level in the upper water-bearing zone increases from 6.17 feet at the beginning of the period (April 6) to a seasonal high of 7.23 feet on April 21. Thereafter, the water-level decreases to 6.5 feet at the end of the study period on May 6. During the spring monitoring event, the water-level in MW-11D follows a similar pattern, increasing from 1.88 feet on April 6 to 2.96 feet by May 6.

Fluctuations in water-levels were compared with local records for rainfall. A comparison of the daily rainfall with seasonal ground-water elevations indicates a relationship between rainfall and periodic rises in ground-water levels for the upper water-bearing zones.

During periods of 0.5 inches or more rainfall, water-levels usually rise in the upper water-bearing zones, such as shown on September 22 (Figures 6.17) and April 21 (Figures 6.21). However there are some inconsistencies with this trend, as shown on April 6 to 10 (Figures 6.21), when a rise in ground-water levels is not associated with a rainfall event.

6.6 Ground-Water Recovery Tests

Ground-water recovery tests were conducted in October 1990 to estimate hydrogeologic properties including transmissivity and hydraulic conductivity in the upper and lower water-bearing zones. Additionally the recovery tests provide sufficient data to allow the development of a constant-rate pumping test, if desirable.

6.6.1 Method for Recovery Tests

Ground-water monitoring wells MW-7S, MW-10S, MW-10D, MW-11S, and MW-11D were selected for the tests based on their representative lithologies and proximity to active processing areas. The monitoring wells represent both upper and lower water-bearing zones which were expected to possibly have dissimilar hydrogeologic properties.

The wells used for the tests were gauged and sounded to obtain static ground-water level measurements before water was removed from the wells. Subsequently, each well was developed by surge block methods to insure optimum well efficiency. Submersible pumps were installed in the wells and tied into an on-site electrical power supply. A 1.25-inch inner diameter, polypropylene pipe with a check valve was used as a discharge line. Flow rates were monitored by timing the removal of water from the well with a premeasured bucket and stopwatch. Pumping proceeded at the maximum rate that could be maintained without pumping to dryness. This provided an estimate of the maximum sustainable yield from each of the wells. The wells were pumped for approximately 1 hour and water was discharged 150 to 200 feet from the wells to preclude adversely affecting the tests. The following table summarizes flow rates at each of the tested wells:

| Well Number | Flow Rate, Q | Drawdown at 1 Hour
(Ft.) |
|-------------|------------------------|-----------------------------|
| MW-7S | 14 gallons per minute | 5.90 |
| MW-10S | 4.1 gallons per minute | 10.52 |
| MW-11S | 4.1 gallons per minute | 9.99 |
| MW-10D | 42 gallons per minute | 9.28 |
| MW-11D | 39 gallons per minute | 19.30 |

Pressure transducers attached to automatic water-level recorders were used to measure water levels. Initially, water-levels were measured manually to provide a baseline water-level. Recovery (rise in water-level in the wells) was measured to an accuracy of 0.01 feet until water levels recovered to 95 to 99 percent of their pre-test static levels.

The recovery tests conducted in the wells were of short duration to minimize the effects of outside stresses on the test results (tidal effects, barometric pressure, rainfall infiltration, etc.). Accordingly, the results of these tests provide only estimates of ground-water recovery in tested wells.

6.6.2 Ground-Water Recovery Test Results

Recovery rates have been interpreted using methods which take into account the well construction and water-bearing zone characteristics. The recovery results and methods of interpretation and analysis are presented and discussed below for the unconfined upper water-bearing zone and semi-confined lower water-bearing zone.

6.6.2.1 Ground-Water Recovery - Upper Water-Bearing Zone

The recovery method adapted from the Jacob straight line method was used to evaluate the data set presented in the previous section. The method assumes the following characteristics:

- The water-bearing zone is uniform in character and the hydraulic conductivity is the same in all directions.
- The zone is uniform in thickness and infinite in areal extent.

- The formation receives no recharge from any source.
- The well receives water from the full thickness of the water-bearing zone.
- The water removed from storage is discharged instantaneously when the head is lowered.
- The well is 100 percent efficient.
- All water removed from the well comes from aquifer storage.
- Laminar flow exists throughout the well and aquifer.
- The water table has no slope.

Semilogarithmic plots of recovery ($S-S_1$) versus time on the logarithmic scale are provided in Appendix I-1. The rate of water-level recovery was shown by plotting a best-fit line for recovery over time. Transmissivity was calculated using the slope of the line. Hydraulic conductivity was estimated by evaluating transmissivity as a function of the thickness of the upper water-bearing zone, which ranges between approximately 7 and 11 feet.

Transmissivities were calculated as 160 ft²/day in MW-7S; 38 ft²/day in MW-10S; 41 ft²/day in MW-11S. Hydraulic conductivities were determined as 22 ft/day for MW-7S; 6.9 ft/day for MW-10S; and 3.6 ft/day for MW-11S.

The summary table below presents the results for transmissivity and hydraulic conductivity.

| Monitoring Well Number | Transmissivity (Feet ² /Day) | Hydraulic Conductivity (Feet/Day) |
|------------------------|-----------------------------------------|-----------------------------------|
| MW-7S | 160 | 22 |
| MW-10S | 38 | 6.9 |
| MW-11S | 41 | 3.6 |

Fetter (1988) reports that the hydraulic conductivity of unconsolidated sediments ranges from 10⁻⁷ to 10⁵ ft/d. For medium to coarse sands characteristic of the upper water-bearing zone, a range of 1 to 300 ft/d is estimated. The measurement of transmissivity is directly related to

hydraulic conductivity by the thickness of the water-bearing zone ($T=Kb$). Therefore, the values of site hydraulic conductivity and transmissivity were estimated within the expected range.

6.6.2.2 Ground-Water Recovery - Lower Water-Bearing Zone

The residual recovery method was used to analyze the data for the lower water bearing zone using the same method as described above. The data, calculations, and graphs are provided in Appendix I-2.

Hydraulic conductivities using the method were 31 ft/day for MW-10D and 12 ft/day using MW-11D. Transmissivities evaluated by the method were 310 ft²/day in MW-10D and 120 ft²/day in MW-11D. The thickness of the lower water-bearing zone is approximately 10 feet.

The summary table below presents the results for transmissivity and hydraulic conductivity in the lower water-bearing zone:

| Monitoring Well Number | Transmissivity (Feet ² /Day) | Hydraulic Conductivity (Feet/Day) |
|------------------------|-----------------------------------------|-----------------------------------|
| MW-10D | 310 | 31 |
| MW-11D | 120 | 12 |

These calculations fall within a previously described range for soils of similar texture, 1 to 300 ft/day (Fetter 1988). Therefore, the calculated results for transmissivity and conductivity are considered acceptable.

6.7 Tidal Influence Study Procedures and Results

A tidal influence study was initiated to evaluate the possible tidal effects of the Passaic River on the upper and lower water-bearing zones of the site. The evaluation of on-site tidal influence provides an additional mechanism to evaluate the site hydrogeology, particularly regarding changes in ground-water levels, flow direction, and the distribution of dissolved constituents in ground water.

6.7.1 Tidal Influence Study Procedures

Three pairs of shallow and deep monitoring wells were selected for the tidal influence study. The well pairs are located along a transect running perpendicular to the river. Well couplet MW-13S and MW-13D is located 55 feet from the river; Well couplet MW-11S and 11D is 370 feet from the river; Well couplet MW-10S and 10D is 625 feet from the river. The testing locations along this transect were selected to determine the relative tidal influence at increasing distances from the river.

After well selection was completed, monitoring of tidal influence was initiated. First, a baseline ground-water level was established by manually measuring the depth-to-water in the test wells. Pressure transducers attached to automated water-level recording devices were subsequently installed in the wells.

Water levels in the test wells were recorded for 8 days. The automated monitoring system averaged the water level readings every two hours, producing 12 measurements daily. After 8 days the pressure transducers were removed from the wells and data was stored on a computer diskette for further analysis.

6.7.2 Tidal Influence Study Analysis and Results

The water level data for the tidal study was plotted on graphs of water level elevation versus time. Data and graphs are presented in Appendix G.

Upper Water-Bearing Zone

In the upper water-bearing zone a more reduced tidal influence was observed. At MW-13S, which is 55 feet from the river, the total tidal fluctuation cycle was 0.06 feet. At locations further from the river, MS-10S and MW-11S, the total tidal fluctuations were between 0.01 to 0.05 feet. These values occurred near the instrument detection level of 0.01, therefore, the accuracy of measurement was limited.

Lower Water-Bearing Zone

The graphs indicates effects of tidal cycles on the lower water-bearing zones showing peaks and troughs corresponding with high and low tides, respectively. The magnitude of the tidal influence is most apparent for MW-13D, which is 55 feet from the Passaic River. In MW-13D total tidal fluctuations were approximately 2.6 feet. The influence is less significant in MW-11S and MW-10S, which are further from the river. At these points total tidal fluctuations were approximately 0.3 feet and 0.1 feet, respectively. Therefore, the results indicate that tidal influence decreases with increasing distance from the Passaic River.

6.8 Ground-Water Sampling Procedures and Analyses

A quarterly ground-water sampling program was conducted for 1 year beginning in June 1990 and ending in March 1991. The twenty-six on-site ground-water monitoring wells were sampled four times during this period: June, September, and December 1990, and March 1991.

The ground-water monitoring wells were gauged prior to each sampling event, measuring depth to water and the depth to the bottom of each well. Water volumes in the well casings were calculated, and a minimum of four well casing water volumes were purged from each well using a submersible water pump. To avoid cross-contamination, the submersible pump was cleaned between use in each well and a dedicated, ¾-inch diameter, PVC pipe was replaced. Equipment cleaning procedures presented in Section 5 are consistent with the Department's Hazardous Waste Program's Field Sampling Procedures Manual published in February 1988. Wells of poor water yield were purged by hand-bailing using a dedicated, pre-cleaned, Teflon® bailer.

After well purging, samples were collected by Roux Associates, Inc. personnel using pre-cleaned Teflon® bailers. Dedicated, non-absorbent, polypropylene rope attached to dedicated, Teflon® coated leader wire was used to lower the bailers into the wells. Samples were poured from the bailers into pre-cleaned, laboratory-supplied, containers. Samples were labeled and wrapped in dedicated plastic bags. Samples analyzed for volatile organic compounds were preserved with HCL to pH < 2; metals were preserved with HNO₃ to pH < 2, and cyanide was preserved with NaOH to pH > 12. Samples were stored in coolers at 4°C and a chain of custody form was

maintained for each shipment. A custody seal was placed on the cooler prior to pick-up by the courier. Field and sampling logs were maintained in a bound field notebook and on Well Sampling Data Forms (Appendix J).

The samples sent daily to Enseco East of Somerset, New Jersey, via courier service.

6.8.1 Ground-Water Sampling and Analytical Quality Assurance/Quality Control

The field QA/QC program met NJDEP requirements as described in the Department's Hazardous Waste Programs' Field Sampling Procedures Manual, February 1988.

The following QA/QC activities were carried out in the field. Trip blanks accompanied VOC sample containers from the laboratory to the field and back to the laboratory. The trip blank was a laboratory-prepared, analyte-free water sample maintained under custody during sampling, transport, and delivery. Field blanks accompanied samples sent to the laboratory each day. The field blank was prepared on-site by pouring laboratory-supplied, analyte-free water over a piece of field sampling equipment after cleaning and immediately prior to sampling. Field blanks were analyzed for VOCs, SVOCs, PCBs, total metals, and total cyanides. The field and trip blank samples provide QA/QC support to evaluate sampling and analytical integrity.

One duplicate sample was obtained for every 20 ground-water samples. Matrix spike and matrix spike duplicate samples were collected every 20 ground-water samples. These QA/QC samples were collected to evaluate laboratory precision and accuracy.

6.8.2 Ground-Water Analytical Procedures

Laboratory procedures were directed by the Department to analyze the parameters on the Contract Laboratory Program (CLP) list, excluding pesticides. For the fourth and final quarterly sampling event, the inorganic (metals and cyanide) parameters were also eliminated with Department approval. VOC analysis followed USEPA Method 624 (or the equivalent 8240), including 30 non-target (tentatively identified) compounds (TICs) from the library search. SVOC analysis followed USEPA Method 625 (or the equivalent 8270), including thirty non-

target (tentatively identified) compounds (TICs) from the library search. PCB analysis was conducted using USEPA Method 608 (or the equivalent 8280). Metals and cyanide were analyzed using the USEPA 600 series methods (or the equivalent SW-846 method).

Based on an agreement with the Department, ground-water samples were analyzed in accordance with procedures, methodology, and holding time specifications, dictated by the Department's Tier I and Tier II requirements. The first round of sampling followed Tier I analysis. The second, third, and fourth sampling rounds followed Tier II with 10 percent of the samples analyzed as Tier I.

Roux Associates, Inc. conducted a third party QA/QC data review validation of a representation of the Tier I data, from the first sampling event in accordance with the Department's Standard Operating Procedure (SOP) for Analytical Data Validation, April 1990. The data validation was voluntarily conducted to determine if sampling and analytical precision and accuracy, holding time specifications, and general sample integrity had been maintained. The results of the data validation were submitted to the Department in Roux Associates, Inc.'s Data Validation Report Ground Water Analyses, July 17, 1991.

Based on the results of the data validation, data quality was determined acceptable, with some minor (qualitative) exceptions. No sample results were rejected. A modified review of all other data was completed to evaluate sample holding times, reporting, and analytical accuracy and precision.

6.8.3 Analytical Results for Four Quarterly Ground-Water Sampling Events

The following section presents the results of the ground-water samples which were analyzed for VOCs, SVOCs, PCBs, and metals and cyanides. Also, results for general chemistry water quality from the first ground-water sampling event are provided.

6.8.3.1 Volatile Organic Compounds

The VOC analysis was conducted using EPA Method 624 or the comparable EPA Method 8240 for target compounds list (TCL) parameters and a forward library search for 30 non-target compounds or tentatively identified compounds (TICs). This analytical procedure uses gas chromatograph/mass spectrometer (GC/MS). The results of the ground-water sampling events are presented on Table 6.4 and 6.5.

Ground-water samples from both the upper and lower water-bearing zones were collected for analysis. The VOCs in the upper water-bearing zone were identified as acetone, benzene, ethylbenzene, toluene, and total xylenes. Chlorobenzene and carbon disulfide were identified in one sample from the upper water-bearing zone. In the lower water-bearing zone, acetone, benzene, chlorobenzene, chloroform, ethylbenzene, toluene, and total xylenes were detected. A discussion of the analytical results for the two water-bearing zones is provided in the following subsections.

VOCs - Upper Water-Bearing Zone

In the upper water-bearing zone, acetone was detected at concentrations of less than 15 micrograms per liter ($\mu\text{g}/\ell$) in the first ground-water sampling event, e.g., GW-1, for samples from wells 8S, 11S, and 12S. In well sample 6S, acetone was reported at 10 $\mu\text{g}/\ell$ in the second round of ground-water sampling. Acetone occurred as a field blank contaminant in the fourth sampling event. It was quantified as 12 $\mu\text{g}/\ell$ in MW-9S and at 12 $\mu\text{g}/\ell$ in MW-11S. Both samples were qualified for field and laboratory contamination. Carbon disulfide was detected during the fourth sampling event in MW-12S at 15 $\mu\text{g}/\ell$. Chlorobenzene was identified above the detection level in one upper water-bearing zone MW-1S at 6 $\mu\text{g}/\ell$ during the second ground-water sampling event.

BTEX compounds (benzene, ethylbenzene, toluene, and total xylenes), were identified in some samples. In MW-11S, benzene was identified at concentrations of 140 $\mu\text{g}/\ell$, 7 $\mu\text{g}/\ell$, 60 $\mu\text{g}/\ell$, and, 320 $\mu\text{g}/\ell$ during the four ground-water sampling events. In MW-11S ethylbenzene was identified at 69 $\mu\text{g}/\ell$, 23 $\mu\text{g}/\ell$, and 44 $\mu\text{g}/\ell$ in sampling events one, two, and four, respectively;

toluene was reported at 6 $\mu\text{g}/\ell$ and 15 $\mu\text{g}/\ell$ in sampling event two and four; total xylenes were estimated at 12 $\mu\text{g}/\ell$, 3 $\mu\text{g}/\ell$, and 10 $\mu\text{g}/\ell$ in sampling events one, two, and four, respectively.

In Sample 15S, benzene was detected in sampling events two, three, and four at concentrations less than 12 $\mu\text{g}/\ell$; ethylbenzene was detected in sampling events two, three, and four at concentrations below 15 $\mu\text{g}/\ell$. Also in MW-15S, toluene was quantitated at 8 $\mu\text{g}/\ell$, 27 $\mu\text{g}/\ell$, 22 $\mu\text{g}/\ell$, and 22 $\mu\text{g}/\ell$ in sampling event one through four; xylenes were detected in sampling events one through four; at concentrations of 10 $\mu\text{g}/\ell$, 25 $\mu\text{g}/\ell$, 23 $\mu\text{g}/\ell$, and 31 $\mu\text{g}/\ell$.

In other samples identification of BTEX compounds was inconsistent from one sampling event to the next. In MW-6S, collected during the second ground-water sampling event, benzene was reported at 5 $\mu\text{g}/\ell$. In MW-4S, ethylbenzene was detected at 6 $\mu\text{g}/\ell$ in the third ground-water sampling event. Benzene was quantified in MW-9S at 19 $\mu\text{g}/\ell$ and in MW-12S at 12 $\mu\text{g}/\ell$ during the fourth sampling event. The BTEX compounds were estimated at concentrations below instrument detection level in several samples, however the presence of these compounds at concentrations below the practical quantification limit (PQL) of the analytical method were inconsistent from one sampling event to the next.

The analytical results suggest that acetone, which is reported in some samples, was introduced as a laboratory contaminant. BTEX compounds occurred more frequently in a random pattern except in MW-11S and MW-15S. Generally, BTEX results were estimates below the instrument detection level. The concentrations of the VOCs in the upper water bearing zone occur in a random and inconsistent pattern from one sampling to the next.

VOCs - Lower Water-Bearing Zone

In the lower water-bearing zone, acetone was identified in the first ground-water sampling event in MW-6D, MW-9D, MW-11D, MW-12D, and MW-15D at concentrations between 11 $\mu\text{g}/\ell$ and 58 $\mu\text{g}/\ell$. In the second ground-water sampling event, acetone was identified in MW-12D at 20 $\mu\text{g}/\ell$. Acetone occurred in the field blanks for the fourth sampling event. It was detected in MW-10D at 76 $\mu\text{g}/\ell$ and in MW-15D at 71 $\mu\text{g}/\ell$. Both sample results were corrected for

blank contamination. BTEX compounds were also identified in the samples collected from the lower water-bearing zone. In MW-8D benzene was identified at 31 $\mu\text{g}/\ell$, 19 $\mu\text{g}/\ell$, and 40 $\mu\text{g}/\ell$ in groundwater sampling events one, two, and four, respectively. In MW-9D benzene was reported in the second sampling event at 10 $\mu\text{g}/\ell$ and below detection levels for other sampling events. Benzene was quantified in MW-11D at 8 $\mu\text{g}/\ell$ in the first sampling event and 5 $\mu\text{g}/\ell$ in the fourth sampling event. In MW-15D, benzene was detected in the first sampling event at 14 $\mu\text{g}/\ell$.

Ethylbenzene was identified only in the first sampling event at 10 $\mu\text{g}/\ell$ for MW-3D, at 8 $\mu\text{g}/\ell$ in MW-11D, and at 5 $\mu\text{g}/\ell$ in MW-15D. Toluene was also identified in the first sampling event in MW-11D, and MW-15D at concentrations of 16 $\mu\text{g}/\ell$, and 6 $\mu\text{g}/\ell$, respectively. Additionally, toluene was detected in the fourth sampling event at 22 $\mu\text{g}/\ell$ in MW-8D.

There were three detections of xylenes. In MW-3D at 7 $\mu\text{g}/\ell$, MW-11D at 6 $\mu\text{g}/\ell$, and in MW-15D at 9 $\mu\text{g}/\ell$. Chloroform was identified in samples from the first ground-water sampling event at 10 $\mu\text{g}/\ell$ in MW-6D and at 18 $\mu\text{g}/\ell$ in MW-15D.

Chlorobenzene were consistently identified at similar concentrations in the lower water-bearing zone and in the same wells. Chlorobenzene identification in the lower water-bearing zone was more consistent than the BTEX compounds. The chlorobenzene results are summarized below for each ground-water sample in a table to emphasize the uniformity of these results.

| Well Sampled | Sampling Event Quarter | Chlorobenzene ($\mu\text{g}/\ell$) | Well Sampled | Sampling Event Quarter | Chlorobenzene ($\mu\text{g}/\ell$) |
|--------------|------------------------|--------------------------------------|--------------|------------------------|--------------------------------------|
| 3D | 1 | 4,400 | 11D | 1 | 54 |
| | 2 | 5,600 | | 2 | 48 |
| | 3 | 5,900 | | 3 | 55 |
| | 4 | 5,300 | | 4 | 39 |
| 7D | 1 | 810 | 12D | 1 | 15 |
| | 2 | 830 | | 2 | 140 |
| | 3 | 760 | | 3 | 510 |
| | 4 | 810 | | 4 | 650 |

| Well Sampled | Sampling Event Quarter | Chlorobenzene ($\mu\text{g}/\ell$) | Well Sampled | Sampling Event Quarter | Chlorobenzene ($\mu\text{g}/\ell$) |
|--------------|------------------------|--------------------------------------|--------------|------------------------|--------------------------------------|
| 8D | 1 | 960 | 14D | 1 | 75 |
| | 2 | 620 | | 2 | 61 |
| | 3 | 820 | | 3 | 82 |
| | 4 | 590 | | 4 | 62 |
| 9D | 1 | 660 | 15D | 1 | 1,200 |
| | 2 | 600 | | 2 | 4,900 |
| | 3 | 400 | | 3 | 7,000 |
| | 4 | 500 | | 4 | 3,600 |
| 10D | 1 | 2,600 | | | |
| | 2 | 2,300 | | | |
| | 3 | 2,600 | | | |
| | 4 | 1,500 | | | |

The concentrations of chlorobenzene occur at the same orders of magnitude in almost every sample for early ground-water sampling events, with the exception of MW-12D. The identification of other VOCs in the lower water-bearing zone was inconsistent and appears unrelated to the presence of chlorobenzene.

6.8.3.2 Semivolatile Organic Compounds

The analysis of semivolatile organic compounds (SVOCs) was conducted using EPA Method 625 or the comparable EPA Method 8270 for TCL parameters and a forward library search for thirty non-target, tentatively identified compounds (TICs). This analytical procedure employs gas chromatograph/mass spectrometer (GC/MS). The results of the SVOCs analyses from these ground-water sampling events are presented on Table 6.6 and Table 6.7.

Samples from both the upper and lower water-bearing zones were collected for SVOC analysis. In the upper water-bearing zone the analytical results indicate the presence of phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, naphthalene, 2-methylnaphthalene, dimethyl phthalate, dibenzofuran, acenaphthene, fluoranthene, fluorene, phenanthrene, and pyrene. The

phthalate, dibenzofuran, acenaphthene, fluoranthene, fluorene, phenanthrene, and pyrene. The identified SVOCs in the lower water-bearing zone include phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, naphthalene, 2-methylnaphthalene, dibenzofuran, acenaphthene, and 1,2,4-trichlorobenzene. The SVOCs identified in the upper water-bearing zone, but not detected in the lower water-bearing zone include dimethyl phthalate, fluoranthene, fluorene, phenanthrene, and pyrene. SVOCs identified in the lower water-bearing zone and not detected in the upper water-bearing zone include 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, and 1,2,4-trichlorobenzene.

SVOCs - Upper Water-Bearing Zone

In the upper water-bearing zone, most of the SVOCs were detected in MW-15S. In MW-15S the SVOCs identified during the four groundwater sampling events include 2-methyl phenol at concentrations ranging from 10 $\mu\text{g}/\ell$ to 38 $\mu\text{g}/\ell$; 4-methyl phenol at concentrations ranging from 14 $\mu\text{g}/\ell$ to 46 $\mu\text{g}/\ell$; 2,4-dimethylphenol at concentrations ranging from 17 $\mu\text{g}/\ell$ to 73 $\mu\text{g}/\ell$; and naphthalene at concentrations between 51 $\mu\text{g}/\ell$ and 410 $\mu\text{g}/\ell$. Acenaphthene was detected at concentrations between 19 $\mu\text{g}/\ell$ and 33 $\mu\text{g}/\ell$, fluorene was reported as 14 $\mu\text{g}/\ell$ and 24 $\mu\text{g}/\ell$, and phenanthrene concentrations ranged from 14 $\mu\text{g}/\ell$ to 34 $\mu\text{g}/\ell$. Also, in MW-15S, fluoranthene and pyrene were identified in the first and second ground-water sampling events, at concentrations ranging from 10 $\mu\text{g}/\ell$ to 19 $\mu\text{g}/\ell$. Dibenzofuran was identified in sampling events one, three, and four between 11 $\mu\text{g}/\ell$ and 20 $\mu\text{g}/\ell$. 2-methylnaphthalene was detected in sampling events two, three, and four between 17 and 29 $\mu\text{g}/\ell$. Phenol was reported in MW-15S at 13 $\mu\text{g}/\ell$ and in MW-11S at 290 $\mu\text{g}/\ell$ during the third sampling event. In the fourth sampling event, phenol occurred at 27 $\mu\text{g}/\ell$ in MW-14S.

In other samples, the identification of SVOCs occurred in an inconsistent distribution from one sampling event to the next. Acenaphthene has been detected occasionally in MW-6S, MW-13S, MW-14S, and MW-16S at concentrations between 10 $\mu\text{g}/\ell$ and 33 $\mu\text{g}/\ell$. Fluorene was detected in MW-6S at 10 $\mu\text{g}/\ell$, 21 $\mu\text{g}/\ell$, and 22 $\mu\text{g}/\ell$ in samples from the first, second, and third ground-water sampling event. Other SVOCs identified in the first ground-water sampling event include dimethyl phthalate in MW-13S at 18 $\mu\text{g}/\ell$ and phenanthrene in MW-10S at 16 $\mu\text{g}/\ell$. In the

second ground-water sampling event, in MW-16S, 2-methyl naphthalene and phenanthrene were reported at 25 $\mu\text{g}/\ell$ and 24 $\mu\text{g}/\ell$, respectively. In the third round of sampling, phenanthrene was identified in MW-14S at 12 $\mu\text{g}/\ell$.

In summary, the results of identified SVOCs in the samples from the upper water-bearing zone occur in a random distribution, except in MW-15S. This indicates that there may have been an intermittent source for most SVOCs in the upper water-bearing zone.

SVOCs - Lower Water-Bearing Zone

In the lower water-bearing zone the results of SVOCs analyses were more consistent from one sampling event to the next than in the upper water-bearing zone. However, SVOCs which are reported as occurring inconsistently and will be discussed first. Phenol was in MW-10D at 43 $\mu\text{g}/\ell$ during the first ground-water sampling event. 2-methylphenol was identified in the first ground-water sampling event for MW-3D at 87 $\mu\text{g}/\ell$. In the second and fourth ground-water sampling event for MW-15D 2-methylphenol occurred at 14 $\mu\text{g}/\ell$ and 15 $\mu\text{g}/\ell$, respectively. 4-methylphenol was identified in the second and fourth sampling event for MW-15D at 25 $\mu\text{g}/\ell$ and 30 $\mu\text{g}/\ell$, respectively. 1,2,4-trichlorobenzene was identified in the third sampling event for MW-8D at 10 $\mu\text{g}/\ell$.

SVOCs detected more consistently are discussed below. 2,4-dimethylphenol was identified for the four ground-water sampling events in MW-3D between 32 $\mu\text{g}/\ell$ and 93 $\mu\text{g}/\ell$ and in MW-14D between 11 $\mu\text{g}/\ell$ and 33 $\mu\text{g}/\ell$. 2,4-dimethyl phenol was identified in the third ground-water sampling event at 10 $\mu\text{g}/\ell$ in both MW-9D and MW-10D. In MW-15D 2,4-dimethylphenol was identified at 140 $\mu\text{g}/\ell$, 96 $\mu\text{g}/\ell$, and 92 $\mu\text{g}/\ell$ in the second, third, and fourth ground-water sampling events, respectively.

1,3-dichlorobenzene was identified in the first three ground-water sampling events for MW-8D at 43 $\mu\text{g}/\ell$, 76 $\mu\text{g}/\ell$, and 130 $\mu\text{g}/\ell$. During the second, third, and fourth ground-water sampling events, in MW-15D, 1,3 dichlorobenzene was identified between 37 $\mu\text{g}/\ell$ and 46 $\mu\text{g}/\ell$. The results for 1,3-dichlorobenzene for MW-3D in the third and fourth ground-water sampling event

were 25 $\mu\text{g}/\ell$ and 21 $\mu\text{g}/\ell$, respectively. In MW-7D, during the third sampling event, 1,3-dichlorobenzene was reported at 13 $\mu\text{g}/\ell$.

1,4-dichlorobenzene was detected in MW-3D, MW-7D, MW-8D, MW-10D, MW-11D, and MW-15D at approximately the same orders of magnitude during each sampling event. The results of MW-3D ranged from 290 $\mu\text{g}/\ell$ to 470 $\mu\text{g}/\ell$; in MW-7D the range was from 99 $\mu\text{g}/\ell$ to 150 $\mu\text{g}/\ell$; in MW-8D the range was from 290 $\mu\text{g}/\ell$ to 750 $\mu\text{g}/\ell$; in MW-10D concentrations ranged from 170 $\mu\text{g}/\ell$ to 270 $\mu\text{g}/\ell$, in MW-11D the concentrations ranged from 30 $\mu\text{g}/\ell$ to 41 $\mu\text{g}/\ell$; and in MW-15D, concentrations ranged from 63 $\mu\text{g}/\ell$, to 650 $\mu\text{g}/\ell$. In MW-14D during the first and fourth sampling event, 1,4-dichlorobenzene was identified at 74 $\mu\text{g}/\ell$ and 55 $\mu\text{g}/\ell$, respectively.

1,2-dichlorobenzene was detected during three ground-water sampling events in MW-8D at 410 $\mu\text{g}/\ell$, 890 $\mu\text{g}/\ell$, 830 $\mu\text{g}/\ell$, and 300 $\mu\text{g}/\ell$; in MW-15D at 13 $\mu\text{g}/\ell$, 98 $\mu\text{g}/\ell$, 100 $\mu\text{g}/\ell$, and 77 $\mu\text{g}/\ell$. The results for 1,2-dichlorobenzene for sampling events two, three, and four occurred between 83 $\mu\text{g}/\ell$ and 120 $\mu\text{g}/\ell$ in MW-3D and between 46 $\mu\text{g}/\ell$ and 56 $\mu\text{g}/\ell$ in MW-10D.

Naphthalene was identified in the four ground-water sampling events in MW-3D, at 470 $\mu\text{g}/\ell$, 510 $\mu\text{g}/\ell$, 490 $\mu\text{g}/\ell$, and 380 $\mu\text{g}/\ell$; in MW-7D at 98 $\mu\text{g}/\ell$, 57 $\mu\text{g}/\ell$, 44 $\mu\text{g}/\ell$, and 59 $\mu\text{g}/\ell$; in MW-10D at 33 $\mu\text{g}/\ell$, 41 $\mu\text{g}/\ell$, 52 $\mu\text{g}/\ell$, and 28 $\mu\text{g}/\ell$; and in MW-14D at 67 $\mu\text{g}/\ell$, 93 $\mu\text{g}/\ell$, 49 $\mu\text{g}/\ell$, and 49 $\mu\text{g}/\ell$. In MW-15D, naphthalene was reported between 470 $\mu\text{g}/\ell$ and 630 $\mu\text{g}/\ell$ in sampling events two, three, and four. Naphthalene was detected in MW-8D at 26 $\mu\text{g}/\ell$ in MW-9D at 16 $\mu\text{g}/\ell$, and in MW-11D at 29 $\mu\text{g}/\ell$ in the third ground-water sampling event.

2-methyl naphthalene was identified randomly in MW-9D, MW-11D, MW-13D, MW-14D, and MW-15D between concentration of 10 $\mu\text{g}/\ell$ and 76 $\mu\text{g}/\ell$. In MW-15D, 2-methyl naphthalene was identified during sampling events one, two, and four at 76 $\mu\text{g}/\ell$, 49 $\mu\text{g}/\ell$, and 41 $\mu\text{g}/\ell$, respectively. In MW-11D, 2-methylnaphthalene was identified at 37 $\mu\text{g}/\ell$ and 26 $\mu\text{g}/\ell$, in sampling events two and four. In MW-9D, 2 methylnaphthalene was reported at 23 $\mu\text{g}/\ell$ and 18 $\mu\text{g}/\ell$ in the last two sampling events. In MW-3D, 2-methylnaphthalene was detected at 10 $\mu\text{g}/\ell$ during the final sampling event. In MW-14D, 2-methylnaphthalene occurred at 10 $\mu\text{g}/\ell$ in the second sampling event.

Acenaphthene was identified in the four sampling events in MW-11D and 14D at concentrations between 17 and 21 $\mu\text{g}/\ell$. The compound was also identified in the blank during the first ground-water sampling event. In MW-15D, during the second and fourth ground-water sampling events, the results for acenaphthalene were 22 $\mu\text{g}/\ell$ and 18 $\mu\text{g}/\ell$, respectively. During the third ground-water sampling event, acenaphthene was identified at 25 $\mu\text{g}/\ell$ in MW-9D and 11 $\mu\text{g}/\ell$ in MW-12D. In MW-11D and MW-14D, acenaphthene occurred in the samples at concentrations between 12 $\mu\text{g}/\ell$ and 30 $\mu\text{g}/\ell$. However, the presence and concentration of acenaphthene alone were inconsistent from one sampling event to the next. For example, in MW-9D acenaphthene occurred in the third and fourth sampling event at 25 $\mu\text{g}/\ell$ and 22 $\mu\text{g}/\ell$. In MW-10D acenaphthene was detected at 12 $\mu\text{g}/\ell$, 20 $\mu\text{g}/\ell$, and 30 $\mu\text{g}/\ell$ in sampling events one, two and four. In MW-12D acenaphthene was identified at 11 $\mu\text{g}/\ell$ in the third sampling event. In MW-15D, acenaphthene occurred at 22 $\mu\text{g}/\ell$ and 18 $\mu\text{g}/\ell$, in sampling events two and four, respectively.

The results of many of the identified SVOCs, such as phenol, 2-methylphenol, 4-methylphenol, dibenzofuran, and 1,2,4-trichlorobenzene are inconsistent. They rarely occur at similar concentrations from one sampling event to the next. However, there were several acid and base/neutral SVOCs including 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene, naphthalene, acenaphthene; 2,4-dimethylphenol; and 2-methyl-naphthalene, identified or estimated below detection levels throughout the four ground-water sampling events and often at similar orders of magnitude.

6.8.3.3 PCBs

The analysis of PCBs was conducted using EPA Method 608. This procedure, which uses gas chromatograph (GC), was conducted to identify Aroclor mixtures 1016, 1221, 1232, 1242, 1248, 1254, and 1260. The PCB results for the four ground-water sampling events are presented by Aroclor and total PCBs in Table 6.8 and 6.9.

PCBs - Upper Water-Bearing Zone

In the upper water-bearing zone the total PCBs were identified for Aroclors 1242, 1248, 1254, and 1260. The detections of 1242 and 1254 were only made during the final sampling event and may be due to the laboratory interpretation of the chromatogram. These Aroclors have not been detected in any media during other sampling since 1983. However, chromatograms were inspected and the data appears to have been correctly interpreted. Identification of PCBs occurred in samples from MW-5S, MW-6S, and MW-7S. Concentrations of total PCBs occurred in MW-5S at 0.5 $\mu\text{g}/\ell$, 1.3 $\mu\text{g}/\ell$, 7 $\mu\text{g}/\ell$ and 1 $\mu\text{g}/\ell$; in MW-6S at 9 $\mu\text{g}/\ell$, 1.5 $\mu\text{g}/\ell$, 0.7 $\mu\text{g}/\ell$, and 0.7 $\mu\text{g}/\ell$; in MW-7S at 3.5 $\mu\text{g}/\ell$, 2.5 $\mu\text{g}/\ell$, 10 $\mu\text{g}/\ell$ and 0.5 $\mu\text{g}/\ell$.

In other ground-water samples the identification of PCBs was reported in a more random distribution from one sampling event to the next. In MW-9S, PCBs were identified in the fourth sampling event as Aroclor 1254 at approximately 3.5 $\mu\text{g}/\ell$. In MW-11S, PCBs were estimated below 1 $\mu\text{g}/\ell$ and 3 $\mu\text{g}/\ell$ during the first and third sampling events, respectively. In MW-13S, during the first ground-water sampling event, PCBs were detected at 0.2 $\mu\text{g}/\ell$. In MW-15S, during the second ground-water sampling event, PCBs were reported at 0.8 $\mu\text{g}/\ell$. In MW-16S, PCBs were estimated as 0.1 $\mu\text{g}/\ell$ and 0.4 $\mu\text{g}/\ell$ in the first and second ground-water sampling events.

In summary, the identification of PCBs in the upper water-bearing zone occurs at approximately the same orders of magnitude in the three sampling events in MW-5S, MW-6S, and MW-7S. The detection of PCBs in samples collected from MW-9S, MW-11S, MW-13S, MW-15S, and 16S occurred inconsistently from one sampling event to the next.

PCBs - Lower Water-Bearing Zone

In the deep water-bearing zone PCBs (Aroclors 1248 and 1260) were identified. Additionally, in samples collected from MW-7D Aroclor 1254 was detected during one sampling event at 0.2 $\mu\text{g}/\ell$. Detection of PCB above the QC in ground-water samples occurred only in MW-9D at concentration of 1.5 $\mu\text{g}/\ell$, 1.8 $\mu\text{g}/\ell$, 2.5 $\mu\text{g}/\ell$, and 2.1 $\mu\text{g}/\ell$. The results of PCBs in other samples were intermittent estimates below the detection level or not detected.

6.8.3.4 Metals and Cyanide

Samples were analyzed for metals and cyanide from the Target Analyte List (TAL) as required by the Department. The samples from the first ground-water sampling event were analyzed using the Department's Tier I requirements. Subsequent samples were analyzed according to the Department's Tier II requirements.

Metals, with the exception of those listed below, were analyzed using EPA Method 200.7, which uses Inductively Coupled Plasma (ICP). Arsenic, selenium, and thallium were analyzed by EPA Methods 206.2, 270.2, and 279.2, respectively, using Furnace Atomic Absorption (FAA) Spectrophotometer. Mercury was analyzed using Cold Vapor Atomic Absorption (CVA) Spectrophotometer according to EPA Method 245.1. EPA Method 335.3, which uses a Continuous Flow Auto Analyzer, was used to analyze total cyanide.

The results of metals and cyanide analysis from the three ground-water sampling events are presented on Table 6.10 and 6.11. Inorganics analyses were eliminated from the list of parameters for the fourth and final ground water sampling event.

Metals and Cyanide - Upper Water-Bearing Zone

In the upper water-bearing zone, 14 inorganic parameters were identified. The concentrations of the identified parameters were generally consistent from one sampling event to the next. The naturally occurring soil and water constituents, such as aluminum, calcium, magnesium, potassium, and sodium occur at the highest concentrations. Heavy metals identified on this site since the 1983 sampling events include arsenic, chromium, lead, vanadium, and zinc.

Metals and Cyanide - Lower Water-Bearing Zone

In the lower water-bearing zone, 13 inorganic parameters were identified. The concentrations of the identified parameters are generally consistent from one sampling event to the next. The commonly occurring elements indicative of saline ground water, i.e., tidal influence, occur at higher concentration in the groundwater from the lower water-bearing unit than the upper water-

bearing unit. These include calcium, magnesium, and sodium. The heavy metals chromium, vanadium, and zinc occurred in most of the well samples.

6.8.3.5 Non-Target Compounds

In addition to the analysis for quantitative measurements of TCLs, the laboratory searched for Non-Target Compounds in the VOC and SVOC analysis. Non-Target Compounds are called TICs because their identification is subject to interpretation and their quantification is an (qualitative) estimate. TICs may include breakdown products of process chemicals or unusual process chemicals which are not included on the list of target compounds.

The identification and interpretation of non-target compounds is made by comparing a mass spectral fingerprint of an identified organic constituent with a library of up to 40,000 compound fingerprints. The accuracy of interpretation may be influenced by the time involved in identification and by the experience of the analyst or interpreter. Additionally, the identification of isomers, break down products of compounds, or unusual compounds, not included in the library interpretation, is often a subjective process. The identification of non-target compounds may be further complicated when the interpreter changes from one sampling event to the next.

For the four ground-water sampling events the interpreter was not the same from one sampling event to the next. This occurred despite efforts to maintain consistency by using the same laboratory for the analysis for the four sampling events. Additionally, most of the compounds identified were isomers which can be interpreted differently by different analysts. As a result of the complexities presented by the interpretation of the mass spectra, the reported TICs varied from one sampling event to the next. The variability in the interpretation of the TICs indicates that the non-target compound search from one sampling event to the next has not strengthened the overall data set.

Non-Target Volatile Organic Compounds

Approximately 16 non-target volatile organic compounds or compound isomers and fragments, i.e. volatile TICs, were interpreted for the four ground-water sampling events. Of the 22

volatile TICs, 4 semi-volatile TCLs were identified including 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and naphthalene. These compounds have been eliminated from the table of volatile TICs because they were quantitated in the corresponding semivolatile sample.

The results of volatile TICs are presented on Table 6.12 and 6.13 and the sample results for each ground water-bearing zone are described below.

Non-Target VOCs - Upper Water-Bearing Zone

The interpretation of the volatile TICs in the samples from the upper water-bearing zone is inconsistent from one ground-water sampling event to the next.

In MW-1S and MW-8S, there were no TICs identified in samples from any sampling event. In all other samples the estimation of total TICs were within the same or similar order of magnitude for each sampling event. However, the interpretation of the compounds present was variable. The table below summarizes the total volatile TICs in the upper water-bearing zone during four sampling events.

| Well Sampled | Upper Water-Bearing Zone Total Volatile Organic TICs ($\mu\text{g/l}$) | | | |
|--------------|--------------------------------------------------------------------------|-------|-------|-----|
| | Sampling Event Quarter | | | |
| | 1 | 2 | 3 | 4 |
| 3S | 11 | ND | ND | ND |
| 4S | 44 | 28 | 120 | 11 |
| 5S | 104 | 109 | 72 | 123 |
| 6S | 7 | 42 | ND | 12 |
| 7S | 196 | 198 | 230 | 144 |
| 9S | 214 | 37 | 43 | 356 |
| 10S | 478 | 600 | 630 | 422 |
| 11S | 1,845 | 1,184 | 2,400 | 50 |
| 12S | 201 | 299 | 390 | 440 |
| 13S | 95 | 74 | 90 | 123 |
| 14S | 132 | 161 | 120 | 149 |
| 15S | 61 | 616 | 35 | 869 |
| 16S | 69 | 111 | 44 | 69 |

Non-Target VOCs - Lower Water-Bearing Zone

The interpretation of the volatile organic non-target compounds in samples from the lower water-bearing zone are also inconsistent from one sampling event to the next. In the lower water-bearing unit no volatile TICs were not detected in MW-3D, MW-6D, MW-10D, and MW-15D. The table below summarizes the total volatile TICs identified in the lower water-bearing zone.

| Well Sampled | Lower Water-Bearing Zone Total Volatile Organic TICs ($\mu\text{g/l}$) | | | |
|--------------|--------------------------------------------------------------------------|-----|-----|-----|
| | Sampling Event Quarter | | | |
| | 1 | 2 | 3 | 4 |
| 6D | ND | ND | ND | 13 |
| 7D | 7 | 23 | ND | ND |
| 8D | 7 | ND | ND | 34 |
| 9D | 80 | 119 | 158 | 190 |
| 11D | 170 | 120 | 18 | 34 |
| 12D | 56 | ND | ND | ND |
| 13D | 88 | 48 | 46 | 58 |
| 14D | ND | 70 | ND | 125 |

In summary, the results of non-target volatile TICs occur randomly and were identified inconsistently.

Non-Target Semivolatile Organic Compounds

Approximately 28 non-target semivolatile compounds or compound isomers and fragments, i.e., semivolatile TICs were interpreted for the three ground-water sampling events. The results of semivolatile TICs are presented on Table 6.14 and 6.15 and the sample results for each ground-water bearing zone as described below.

Non-Target SVOCs - Upper Water-Bearing Zone

There were approximately 22 semivolatile TICs identified during the four sampling events in the samples from the upper water-bearing zones. The interpretation of semivolatile TICs in the samples from the upper water-bearing zone was inconsistent from one sampling event to the next. The estimated total semivolatile TICs from each sampling event were in general within

the same or similar orders of magnitude in all the samples from the upper water-bearing zone. However, the identification of compounds was variable. The table below summarizes the total semivolatile TICs in the upper water-bearing zone.

| Well Sampled | Upper Water-Bearing Zone Total Semivolatile Organic TICs ($\mu\text{g}/\ell$) | | | |
|--------------|---------------------------------------------------------------------------------|--------|-------|-------|
| | Sampling Event Quarter | | | |
| | 1 | 2 | 3 | 4 |
| 1S | 7 | 493 | 58 | ND |
| 3S | 3,214 | 633 | 469 | 507 |
| 4S | 153 | 227 | 266 | 21 |
| 5S | 900 | 1,061 | 1,027 | 690 |
| 6S | 388 | 1,234 | 988 | 232 |
| 7S | 769 | 838 | 690 | 661 |
| 8S | 40 | 54 | 13 | ND |
| 9S | 1,414 | 1,061 | 869 | 579 |
| 10S | 2,872 | 3,523 | 2,142 | 2,735 |
| 11S | 2,065 | 2,255 | 1,624 | 1,207 |
| 12S | 2,363 | 1,988 | 1,894 | 710 |
| 13S | 865 | 591 | 401 | 427 |
| 14S | 265 | 440 | 453 | 520 |
| 15S | 222 | 10,790 | 1,977 | 93 |
| 16S | 1,489 | 2,050 | 1,893 | 1,074 |

In summary the total concentrations of semivolatile TICs are relatively constant from one sampling event to the next. However, the laboratory identification of the semivolatile TICs is more variable.

Non-Target SVOCs - Lower Water Bearing Zone

Approximately 26 TICs were identified during the three sampling events in the samples from the lower water-bearing zones. The interpretation of semivolatile TICs in the samples from the lower water-bearing zone is inconsistent from one sampling event the next. The table below summarizes the total semivolatile TICs in the lower water-bearing zone.

| Well Sampled | Lower Water-Bearing Zone Total Semivolatile Organic TICs ($\mu\text{g}/\ell$) | | | |
|--------------|---------------------------------------------------------------------------------|-----|-----|-------|
| | Sampling Event Quarter | | | |
| | 1 | 2 | 3 | 4 |
| 3D | 435 | 378 | 170 | 158 |
| 6D | 561 | 252 | 133 | 22 |
| 7D | 1,660 | 52 | 51 | 38 |
| 8D | ND | 23 | 110 | ND |
| 9D | 568 | 406 | 362 | 272 |
| 10D | 359 | 507 | 456 | 751 |
| 11D | 763 | 395 | 199 | 199 |
| 12D | 823 | 508 | 338 | 209 |
| 13D | 100 | 129 | 53 | 14 |
| 14D | 119 | 327 | 100 | 185 |
| 15D | 1,491 | 271 | 374 | 2,552 |

The results of the total semivolatile TIC analyses for samples from the lower water-bearing unit indicate a similar conclusion to those from the upper-water bearing unit. That is, that while the total semivolatile TIC estimates remain relatively constant from one sampling event to the next, the laboratory identification of the semivolatile TICs is variable.

6.8.3.6 Wet Chemistry Methods

At the request of the Department, a limited number of samples were analyzed for water quality analyses. Ground-water monitoring well couplets MW-9S and 9D, MW-10S and 10D, MW-11S and 11D, MW-12S and 12D were selected for these analyses during the first round of ground-water sampling. Procedures for the analysis of wet chemistry parameters were in accordance with the requirements by the USEPA for Drinking Water Program (500-series). Ammonium, chloride, fluoride, nitrate, nitrite, orthophosphate, silica, sulfate, and total Kjeldahl nitrogen were analyzed by Flame Atomic Absorption. Ion specific probes were used to measure pH and alkalinity. Total dissolved and total suspended solids were analyzed by standard methods of filtration. The results for the analyses are presented in Table 6.16.

In the lower water-bearing zone ground-water concentrations for alkalinity, chloride, sulfate, total dissolved solids, and total suspended solids were greater than in ground water in the upper water-bearing zone. These parameters are also usually greater in sea water than freshwater; therefore, their occurrence at elevated levels in the tidally influenced lower water-bearing zones is expected.

7.0 ADDITIONAL ACTIVITIES

Roux Associates, Inc. conducted additional activities to complete the scope of work in the RI Work Plan. This included air quality monitoring and an investigation of surrounding land use, e.g., well record search. The Department also directed an off-site investigation of potential sources of chlorobenzene in the lower water-bearing unit, in their January 7, 1991 letter (comments to Draft Phase I of Phase II RI Report, October 1990). Also, the April 1 letter from the Department (Comments to Addendum II) recommended an evaluation of the sources, extent and transport, and toxicity of the TICs. These activities are summarized below. Additionally, details for transportation and disposal of drilling muds and fluids, collected and drummed during the subsurface drilling activities are summarized.

7.1 Air Quality Monitoring

Two methods of air monitoring were used on the site. One involved the collection of ambient air filters, during subsurface drilling activities, for subsequent laboratory analysis of PCBs and total particulates. The other method was the use of an Organic Vapor Monitor (OVM), also during subsurface drilling activities.

7.1.1 Filter Samples

Air monitoring was conducted on the site during subsurface drilling from May 14 to 18, 1990. Two sampling locations were selected within the PDA, which was considered to be the area of highest PCB concentrations. Two additional air samples were collected at an upwind and downwind location. Copies of the air monitoring field logs are provided in Appendix K.

At the four locations, two Gillian Universal Constant Flow Samplers, e.g. air pumps, were used to collect filter samples. One sampler was fit with a 37 mm PVC filter for collection of total particulates and the other was fit with a 13 mm polypropylene filter for collection of air borne PCBs. The filters were to be changed during the 8-hour day if they became visibly covered with dust. This did not occur, therefore, each sampler operated over an approximate 8-hour period. Forty filters were collected during the 5-day monitoring period.

The filters were sent daily to a New Jersey Certified Laboratory, ERCO, an ENSECO laboratory, located in Cambridge, Massachusetts. Airborne PCBs were analyzed by a modified US EPA Method 8080 and total particulates was measured by standard (NIOSH) gravimetric procedures. The results for all analyses were negative at detection levels ranging between 0.022 $\mu\text{g}/\ell$ and 0.029 $\mu\text{g}/\ell$ for PCBs and 1.3 $\mu\text{g}/\ell$ and 4 $\mu\text{g}/\ell$ for total particulates. Observations of minimal dust on the site from Roux Associates, Inc. field personnel support the undetected total particulates and PCB results from the laboratory analysis. The gravel layer, spread across the site is up to 6-inches thick in the process area and, may serve to minimize dust on the site.

7.1.2 OVM Monitoring

During installation of wells and Phase I soil borings in May 1990 and Phase II soil borings in April 1991, an Organic Vapor Meter (OVM) was used to measure organic vapors. OVM monitoring was also conducted during Phase I surface sampling activities. The background concentrations of the OVM were set before drilling began at a point upwind of the process area. Background organic vapors were below 1 part per million (ppm) during the monitoring periods. Tables 7.1 to 7.4 present results of the OVM monitoring for Phase I and Phase II subsurface investigations.

The OVM readings during Phase I drilling operations ranged from 0 to 800 ppm. The highest detections occurred within the process area, i.e., near the Sterox Structure and AP Structure, at depths between 2 to 8 feet below the surface. During well installation, OVM readings above 10 ppm were noted at MW-16S, MW-6D, MW-7D, MW-9D, and MW-11D. Organic vapor readings exceeded 10 ppm for Soil Borings SSP 1, SSP 2, SSP 3, TSP 4, APS 1, APS 2, and APS 3. Surface soil results exceeded 10 mg/kg in APS-SS-01, APS-SS-02, and SSS-SS-02. Other organic vapor readings for surface soils were at or below background levels.

During the Phase II subsurface soils investigation, OVM readings ranged from approximately 0 to 400 ppm. The highest concentrations occurred at the 2 to 8 foot depth interval at locations within the process area. The organic vapor measurements exceeded 10 ppm at sample locations APSS 4, APSS 5, APSS 6, TSP 5, SSP 4, SSP 5, SSP 6, and SSP 7.

The results of the OVM measurements compared to the laboratory analytical results indicate that the OVM readings may correspond with the presence of volatile and semivolatile TICs and they do not necessarily indicate the presence of PCBs or other target analytes.

7.2 Well Record Search

A search of the Department's well permit records was conducted to identify supply wells at sites within a 1-mile radius of the Kearny Monsanto Plant. Included is a well record for domestic use for the Coca-Cola Company. The well is 650 feet deep and produces from the Brunswick Formation. Other supply wells identified provide water for commercial or industrial use only. Most of the wells identified in the well record search are used for testing and environmental monitoring. The well records provided by the Department are presented in Appendix L.

Well construction and geology described in the well records confirmed the reports for regional geology. The records indicate that the upper water-bearing unit does not extend throughout Kearny Point, but only within the areas which have been reclaimed with fill material. The peat and clay layer underlying the site upper water-bearing zone, occurs at the surface of surrounding land which has not been filled.

Well records were also used to identify industries surrounding the site. The records identified some industries which are potential off-site sources of chlorobenzene, which was detected in the lower water-bearing unit. These potential sources are presented in the following section.

7.3 Off-Site Sources of Chlorobenzene

Chlorobenzene and dichlorobenzenes have been consistently identified at high concentrations in the lower water-bearing zone (see Section 6). Additionally, the compounds were also identified in the lower water-bearing zone during previous ground-water investigations (Section 4). There has been very little indication of this compound in the site soil matrix or the upper water-bearing zone.

Chemically, chlorobenzene and dichlorobenzenes are slightly soluble and have low to moderate mobility. They are more likely to be identified in soil than in a water matrix. However, when in a water matrix, these compounds tend to sink, because they are heavier than water. These compounds also decompose slowly.

During a December 10, 1990 telephone conference call with the Department, the case management team directed the Roux Associates, Inc. Remedial Investigation to identify the source of the chlorobenzenes. Roux Associates, Inc. explained that there was no known on-site source of chlorobenzenes or dichlorobenzenes; that they occurred in the deep (semi-confined) water-bearing zone only and were not identified in soils or the shallow water-bearing zone. Also, chlorobenzenes occurred in samples from on-site wells monitoring the area upgradient from the process units. Based on their chemical nature, had these compounds originated on the site, they would most likely have been detected in the soil matrix or shallow ground water. The source of the chlorobenzenes is, therefore, apparently from an off-site, upgradient location.

The Department then directed Roux Associates, Inc. to conduct an industrial search of the surrounding area; identifying potential industrial sources of chlorobenzenes and providing case file and program identification numbers, as documented in the Department's December 19, 1990 and January 7, 1991 correspondence with Monsanto/Roux Associates, Inc. Roux Associates, Inc. responded by submitting to the Department a list of potential sources, as described below.

A list of potential off-site sources with site case file numbers, including Discharge to Ground Water permit numbers and Bureau of Underground Storage Tanks program numbers were sent to the Department by Roux Associates, Inc. on February 26, 1991, followed by an updated list and a location map on March 14 (Appendix M). The upgradient landfills (Items 1, 3, and 10) and Standard Chlorine (Item 11) were considered the most likely sources. Also, Roux Associates, Inc. conducted a drive-by investigation of the area on May 8, 1991 to locate other potential sources. G & S Technologies Division, "The Transformer People," was located north of the site. The facility reconditions transformers, an activity which may have used chlorobenzene as a cutting solution for PCB oils.

The Department's case team then reviewed the files; however, a suspected source of chlorobenzenes was not identified. There was no data from the landfills which indicated the presence of chlorobenzene. Although detectable levels of chlorobenzene were identified in the lower water-bearing zone at the Standard Chlorine site, the ground-water beneath the site flows towards the Hackensack River, on the opposite side of Kearny Point. Therefore, it is not considered a potential source of chlorobenzenes. G & S Technologies has no monitoring wells. The only source information regarding hazardous substances associated with the site are disposal manifests, which cite only PCBs .

Additional sources of chlorobenzene have been considered. One source could be a possible spill along the upgradient rail lines. Another could be pesticides sprayed as mosquito control in the adjacent wetlands.

The search to identify an off-site source for the chlorobenzenes has been inconclusive. However, due to the chemical nature of chlorobenzenes and the local geology, it is likely that these compounds would have been detected in the soils or in the upper-water bearing zone if the source is the Monsanto Kearny Plant. To substantiate these observations, off-site ground-water monitoring and possibly well installation must be permitted during the feasibility study and remediation of the site.

7.4 Transport and Disposal of Waste from Subsurface Activities

Drilling muds, cuttings, and development water from the Phase I subsurface soils activities were placed in eighteen 55-gallon drums. The drums were labeled with the source and material, and stored in an on-site facility designed for hazardous and non-hazardous waste storage. Based on analytical results, drums containing PCBs in excess of 50 mg/kg were labeled as hazardous in accordance with TSCA (Toxic Substances Control Act) requirements. Subsequently, composite samples were collected from the non-hazardous (TSCA) waste stream and from the hazardous (TSCA) waste stream. The samples were sent for waste characterization of some RCRA (Resource Conservation Recovery Act) parameters (specifically TCLP metals), to Reliance Laboratory, a New Jersey certified laboratory. Concentrations were below the RCRA, regulatory action levels and the results are presented in Appendix N.

The drums containing the TSCA hazardous PCB waste were sent under hazardous waste manifest to a TSCA approved holding facility, Tipton Environmental Technologies, Tipton, Missouri. Subsequently, 17 of these drums were transported to Rollins Environmental Services, Deer Park, Texas for incineration. One drum, which contained a piece of concrete was inappropriate for incineration and was sent to U.S. Ecology, Inc., a landfill in Beatty, Nevada. Copies of the completed manifests are also presented in Appendix N.

The solid waste from soil cuttings and drilling muds from the Phase II soil boring activities were collected and drummed in two 55-gallon drums. Representative samples were analyzed for RCRA waste characteristics, including TCLP analysis of metals and organic compounds. PCBs were also analyzed. None of the results exceeded the regulatory action levels for RCRA, however PCB concentrations of 200 mg/kg exceeded the acceptable TSCA limits, and therefore, the waste disposal is regulated by TSCA. The drums were transported on August 26, 1991 to Rollins Environmental Services, Deer Park, Texas, for incineration. A copy of the manifest is also included in Appendix N.

7.5 Potential On-Site Sources of Non-Target Compounds

The Department recommended that the non-target compounds be evaluated to determine if they were related to material stored on-site. After completing an evaluation of products and raw materials stored on-site, Roux Associates, Inc. compared the products and raw materials with the compounds identified in the library search for VOC and SVOC analyses (see tables of analytical results presented in Sections 5 and 6).

Many of the non-target compounds identified on-site can be directly related to on-site products and raw materials. Other target compounds may be similar to on-site products and may be characterized as weathered by-products or product impurities. The following discussion compares some of the non-target compounds with products and raw materials stored on-site.

The non-target VOCs, C-3 benzene and C-4 benzene were commonly identified in the analyses. A potential source of C-4 benzene and possibly C-3 benzene may be Alkylate, a C-4 benzene stored in tanks to the east of the APSS.

Several hydrocarbon chain compounds, e.g. C-14 H-20 O-2, C-15 H-12, and C-20 H-12, were commonly identified as non-target compounds. Although many of the hydrocarbon chains identified by the laboratory did not match descriptions of on-site products or raw materials, they are similar to materials stored on-site. Hydrocarbon chain compounds identified in the non-target analyses may be breakdown products or product impurities from the on-site materials. Some of the hydrocarbon materials stored on-site, are described below. A lubricant oil, N-N diethylhydroxylamine, has the chemical structure, C-4 H-11 N O. It is stored in the lubricant storage area, north west of the process area. An on-site product dodecylphenol C-12 H-25 C-6 H-4 OH, and is stored in tanks east of the process area. Benzoyl peroxide, C-4 H-10 O-4, was used on-site as a bleach during the former STP manufacturing process. Malaeic anhydride, C-4 H-2 O-3, is stored on-site in tanks west of the APSS.

The source of commonly identified non-target compounds C-9 and C-12 hydrocarbons, may be the olefins, nonene and propylene tetramer. Nonene is described as a C-9 olefin and propylene tetramer is described as a C-12 olefin.

Nonylphenol and dodecylphenol (also 4-nonylphenol and 4-dodecylphenol), and other phenols, such as C-2 phenol, C-3 phenol, C-4 phenol, 4(1-methyl-1-phenyl) phenol were identified as non-target compounds. The phenols may be related to on-site materials such as phenol which is stored in tanks west of the process area and nonylphenol and dodecylphenol, which are stored in tanks east of the process area.

In the surface soils some of the non-target compounds include a variety of chlorinated biphenyls. The specific source of these biphenyls was not apparent; however they may be weathered by-products or impurities from the heat transfer fluid which contained PCBs.

Although the laboratory interpretation of the non-target compounds was extensive, many of the compounds were described as Unknowns. The laboratory has explained that the Unknowns are likely to be breakdown products which have decomposed beyond recognition.

8.0 BASELINE HUMAN HEALTH RISK ASSESSMENT

Data from the remedial investigation (RI) provide the information to conduct a baseline risk assessment. Appropriate guidance documents from the USEPA for conducting risk assessments under CERCLA include:

- Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA (USEPA, 1988a)
- Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (RAGS) (USEPA, 1989a)
- Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, OSWER Directive 9285.6-03 (USEPA, 1991a)

This evaluation defines the potential risk to human health posed by the Monsanto Kearny Plant in the absence of any remedial action. Several steps in this analysis include:

- A review of the site environmental setting and history
- Identification of site-related chemicals and media of potential concern
- A determination of toxicity potential for chemicals identified as being of possible concern for the site
- A determination of potential exposure pathways based on possible uses of the site
- Preparation of health-protective estimates of intake by the exposure pathways described
- Estimates of possible human health risk and the uncertainties associated with this estimate

Although this baseline human health risk assessment addresses the site in its current use, it is prudent to consider alternate uses of the site should Monsanto discontinue present operations. Section 8.7 discusses future potential uses of the site and defines potential risks to human health that could be associated with these future uses.

8.1 Site Setting and History

As previously described in Section 2, the Monsanto Kearny Plant occupies approximately 16 acres in the town of Kearny, Hudson County, New Jersey. The site is located on Pennsylvania Avenue in Kearny Point, a highly industrialized area. The site is bounded to the west by the Passaic River, to the north by a railroad yard, and to the south and east by warehouses and trucking facilities. Prior to its purchase and development by Monsanto in the early 1950's, the site was used as a rail yard. Currently, the site is used by Monsanto for product manufacturing and distribution.

From 1955 to 1985, Monsanto manufactured phosphoric acid and sodium tripolyphosphate at the Plant. Beginning in 1956, surfactants (Sterox) were produced, and in 1960, alkylphenols were added to the manufacturing processes. Currently, Monsanto produces surfactants (Sterox) and alkylphenols at the Plant.

The manufacture of alkylphenols requires a thermal system for heat transfer. Until 1972, the heat transfer fluid used in the thermal system was a polychlorinated biphenyl (PCB) mixture. Although the thermal system is a closed recirculating loop, during a process malfunction in 1967 or 1968, the production reactants became mixed into the thermal system, causing the heat transfer fluid to solidify. This solidified heat transfer fluid was subsequently buried in an on-site disposal pit. When the system was converted in 1972 to a non-PCB based fluid, the old fluid, which contained PCBs, was discarded into the same disposal pit.

8.2 Identification of Chemicals and Media of Potential Concern

The media sampled at the site to identify chemicals of potential concern were soil, groundwater, and air. Chemicals of potential concern are chemicals that are potentially site related and also have data of sufficient quality to be used in a quantitative risk assessment.

Prior to May, 1990, sampling at the site was conducted to determine both the areas of concern on the site, and the horizontal and vertical extent of chemical concentrations potentially present

in these areas. Based on these sampling efforts, the areas of concern on the site were determined to be the areas adjacent to sumps and settling ponds.

8.2.1 Chemicals Identified in Soils

Surface soils in the identified areas of concern were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). Background sampling was performed at on-site locations not adjacent to the sumps and ponds. Tables 5.17 to 5.22 present surface soil analytical results.

Volatile organic compounds were detected in 8 of the 15 surface soil samples. However 4 of these 8 samples had only a single detection of acetone at an estimated concentration that was below the detection limit. The remaining four samples had random detections of xylene and toluene, with several of these detections at concentrations below the detection limit. The RAGS (USEPA, 1989a) states that for chemicals detected infrequently or at low concentrations it is reasonable that they be eliminated from the quantitative risk assessment. Thus, volatile organic compounds do not appear to be potential chemicals of concern in the soil.

Of the semi-volatile organic compounds (SVOCs), the polynuclear aromatic hydrocarbons (PAHs) were the only group of compounds that were detected with any consistency. Table 8.1 is a summary of the site-related concentrations and background ranges of PAHs. Some SVOC tentatively identified compounds (TICs) were also observed in surface soil samples. Although these compounds are, by definition, not fully identified, the TICs included 4-nonylphenol and 4-dodecylphenol. Both of these compounds are end manufacturing products at the site and thus it is reasonable to assume that these TICs are likely to be present. Table 8.2 is a summary of the site-related concentrations and background ranges of nonylphenol and dodecylphenol. Although the analytical data for nonylphenol and 4-nonylphenol were presented separately, the data for these two compounds were combined and presented as nonylphenol for purposes of this risk assessment.

Monsanto records indicate that the PCB mixture used as a heat transfer fluid was Aroclor 1248. In surface soils, Aroclor 1248 and Aroclor 1260 were detected. The presence of Aroclor 1260

at the site may be due to either environmental modification of Aroclor 1248, the presence of impurities in the Aroclor 1248 mixture, or off-site migration from sources such as the adjacent railroad. Table 8.3 summarizes the background and site-related concentrations of PCBs in soil.

8.2.2 Chemicals Identified in Groundwater

Ground-water samples were collected from both shallow and deep wells on the site. No group of chemicals (VOCs, SVOCs or PCBs) were detected consistently. Because of this fact, and more importantly, the fact that ground water beneath the site has no human use, groundwater does not present a medium of concern. Thus, it is not necessary to evaluate groundwater as either a source or receiving medium for potential chemicals of concern in this risk assessment.

8.2.3 Chemicals Identified in Air

Air samples were collected at the site and analyzed for PCBs and total suspended particulates (TSPs). Neither PCBs nor TSPs were detected in these air samples. Thus, ambient air does not contain any potential chemicals of concern. However, because PCBs and PAHs have been identified in surface soils, exposure scenarios will consider the possibility of fugitive dust generated as a result of construction, production, or manufacturing activities.

8.2.4 Summary of Chemicals Identified

Available data suggests that the medium of greatest potential concern at the Monsanto Kearny Plant is surface soil. Chemicals identified as being of potential concern in these surface soils include Aroclor 1248, Aroclor 1260, and the possibly carcinogenic PAHs. Although nonylphenol and dodecylphenol have only been detected as TICs, because of their identification in surface and sub-surface soil samples and their association with the plant manufacturing processes, they will be included as chemicals of potential concern.

8.3 Toxicity Assessment

The toxicity assessment summarizes potential adverse health effects that could occur from exposure to particular substances. Where possible, the toxicity assessment includes a brief overview of the relationship between exposure to the compound and the increased likelihood and/or severity of adverse effects. With the exception of polyaromatic hydrocarbons (PAHs), both carcinogenic and noncarcinogenic effects of the identified potential chemicals of concern will be addressed in the following sections. The discussion of PAHs will be limited to those that potentially have carcinogenic properties.

Information on the toxicity of a chemical presented in the toxicological profile may have no direct bearing on any anticipated human effects. Thus, potential exposure at the Monsanto Kearny Plant does not imply that any of the described toxic effects will be observed. This information is instead provided to illustrate the range of toxic effects often only observed in experimental animals or in humans as a result of accidental exposure to extremely high concentrations of pure compounds that have no relevance to exposure to low levels in environmental media.

8.3.1 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are a family of over 200 individual congeners composed of two linked benzene rings that are chlorinated at one or more sites on the biphenyl structure. PCB mixtures contain biphenyl congeners with varying degrees of chlorination and the mixtures are defined by the total percentage of chlorination. In the USA, commercial PCB mixtures were sold under the trade name Aroclor, with a number to designate the degree of chlorination. In the past, PCBs were used widely as coolants and lubricants and in the manufacture of products such as plastics and adhesives because of their flame retardant and insulating properties. The manufacture of PCBs in the USA ceased in 1977 due to evidence that PCBs are environmentally persistent and at high doses were toxic to animals. There was a concern that PCBs may also have the potential to impact human health.

A definitive evaluation of the toxicology of PCBs is difficult for many reasons. PCB mixtures (Aroclors) contain many different congeners. Thus, different production lots of the same mixture can vary greatly in the congener content, even when the average chlorine content is the same. Additionally, PCB mixtures are known to sometimes contain various impurities, such as polychlorinated dibenzofurans (PCDFs) and polychlorinated quaterphenyls (PCQs), which may have toxicities equal to or greater than PCBs (Kashimoto et al., 1985). Furthermore, PCBs that humans are ultimately exposed to may be significantly different from the original mixture because of changes in the congener and purity level following environmental and biological transformation. Laboratory experiments performed to determine the toxicological properties of PCBs are often limited to a specific mixture of PCBs. At the present time all PCB mixtures are treated as carcinogens although the scientific evidence to date does not support this approach. There is evidence that one Aroclor mixture, namely Aroclor 1260, at high doses does cause the formation of a statistically significant number of cancerous tumors in rats. However, to use this information, which is largely based on two poorly designed studies, to support the hypothesis that all Aroclor mixtures are carcinogenic is not valid.

The Institute for Evaluating Health Risks (IEHR) has recently completed a study in which they reassessed the pathological diagnoses in five key rat PCB studies (Abelson, 1991; Moore, 1991; USEPA, 1991b). Based on this study, John A. Moore, President of IEHR recommends that the USEPA reconsider their PCB cancer risk policy (Moore, 1991). Specifically, he recommends that separate risk assessments be developed for each of the major PCB formulations to reflect the fact that rats fed PCB mixtures of 54% or 42% chlorination did not experience statistically significant elevations in incidences of liver tumors. Furthermore, he recommends lowering the cancer potency factor (CPF) for Aroclor 1260 to 1.9 mg/kg/day. Thus, based on available information, for purposes of this risk assessment, Aroclor 1248 will be assumed to be noncarcinogenic and Aroclor 1260 will be assumed to be carcinogenic. The following sections outline the relevant toxicological studies and information regarding the noncarcinogenic and carcinogenic properties of PCBs.

8.3.1.1 Noncarcinogenic Properties of PCBs

Very little data exists regarding the kinetics of PCB mixtures in humans or animals. Metabolic and pharmacokinetic behavior varies with each congener, according to position and degree of chlorination. PCB mixtures are known to be absorbed through the gastrointestinal tract, epidermis, and pulmonary tissues. The gastrointestinal absorption of most congeners is probably greater than 90 percent, but the degree of absorption of PCBs following dermal or pulmonary exposure is not known (ATSDR, 1989a). Maroni et al. (1981a) evaluated 80 industrial workers exposed to PCB mixtures with 42 percent chlorine content as a result of their specific work assignments. PCBs were measured in the air, on workroom surfaces, on palms of workers hands, and in workers' blood. Blood PCB levels were found to correlate closely with length of exposure, but not to assumed exposure amounts, and the authors concluded that dermal absorption of PCBs was the main route of exposure for these workers.

PCBs are very lipophilic and resistant to metabolic breakdown. Thus, they concentrate in fatty tissues in the body, and will tend to be present in a given organ in proportion to the fat content of that organ. Because humans excrete very little fat, excretion of PCBs from the body is slow. PCBs in serum fat remain in steady state with PCB stored in body fat. The half-lives of elimination from the blood of three PCB congeners present in Aroclor 1254 were found to range from 124 to 338 days (Buhler et al., 1988). PCBs are known to be excreted through human breast milk because of its high fat content. Numerous studies have been conducted on the PCB content of human milk, and there is evidence that the transfer of PCBs from mother to child is greater via breast milk than across the placenta (Masuda et al., 1978).

Analytical studies indicate that most individuals carry body burdens of PCBs in their adipose tissues in the range of 0.1-1.0 mg/kg as a result of environmental exposure (Safe, 1989). Any potential health effects that may result from these background levels have not been evaluated.

Furthermore, data regarding human health effects from exposure to high levels of PCBs are not extensive. Only two groups of people are known to have experienced exposure to high levels of PCBs:

- Those persons who ingested PCB-containing rice oil in the "Yusho" and "Yu Cheng" incidents
- Occupationally exposed workers

Although victims of the "Yusho" and "Yu Cheng" accidents experienced symptoms such as severe skin disorders and nausea and even some deaths resulted, it was later determined that the PCB mixtures involved also contained high levels of polychlorinated dibenzofurans and polychlorinated quaterphenyls. Based on subsequent studies, it has been generally concluded among the scientific community that the toxic effects seen in the persons who accidentally ingested the contaminated rice oil were most likely due to the presence of dibenzofurans and quaterphenyls rather than the PCBs (Kashimoto et al., 1985).

Persons who have had the potential to be exposed to PCBs through their work represent the best source of information on possible health effects resulting from PCB exposure. For example, workers in the electrical industry have been found to have serum PCB levels higher than the general population (Smith et al., 1982; Hosek, 1988; Emmett et al., 1988). Occupational exposure has been associated with reversible skin lesions and increases in serum hepatic enzymes. These increases in serum enzymes have, however, shown inconsistent patterns and typically have not been associated with hepatic dysfunction (ATSDR, 1989a). Smith et al. (1982) found serum glutamic-oxaloacetic transaminase (SGOT), gamma-glutamyl transpeptidase (GGTP) and triglyceride were positively and significantly correlated with serum PCB concentrations in workers occupationally exposed to PCBs. However, on clinical examination, these workers did not demonstrate a consistent pattern of abnormalities, and none were found to have acneform lesions indicative of chloracne. In a similar study of underground electric utility workers, Hosek (1988) reported slightly different findings. While workers did demonstrate a positive correlation between serum PCB levels and liver enzymes, the correlation was weak at best. However, a correlation was found between serum PCBs and triglycerides. As in the study by Smith et al. (1982), Hosek (1988) did not find any additional clinical or physical symptoms in the workers that were typically associated with PCB exposure. After

adjusting for confounding variables in his epidemiological study, Emmett (1985) did not note significant differences between exposed and comparison groups on liver function tests. However, even after adjusting for confounding variables, there was a statistically significant correlation between serum PCBs and serum gamma glutamyl transpeptidase. Because PCBs are known inducers of hepatic microsomal enzymes, Emmett suggested that the elevation of this enzyme level could be related to microsomal enzyme induction rather than frank liver damage.

Dermatological effects associated with long-term exposure to PCBs were evaluated in a cross-sectional study of capacitor manufacturing workers, where almost 40 percent of the workers had been employed for 20 years or more (Fischbein et al., 1982). While a high prevalence (37 percent) of dermatological abnormalities was found among these capacitor workers following examination, the PCB-associated chloracne was noted less frequently than among the "Yusho" patients. There was an association between dermatological findings and plasma PCB concentration; however, the authors stress that PCB contaminants such as polychlorinated dibenzofurans should be considered as having a potential to contribute to these dermatological effects.

Maroni et al. (1981b) also conducted a study of 80 electrical workers who had been exposed to the 42 percent chlorinated PCB mixtures. While some dermatological effects such as chloracne were noted, these effects could not be related to PCB blood concentrations. In another study, a tentative blood PCB concentration of 2.0 μg PCB/dL blood (200 ppb) for occupationally exposed workers was suggested (Ouw et al., 1976). This value was determined following the examination of 34 electrical workers who complained of nausea and a burning sensation of the face and hands after having worked with Aroclor 1242. While only 6 workers had dermatological lesions, including a single case of chloracne, and the mean blood levels of Aroclor 1242 were approximately 40 μg PCB/dL blood (400 ppb), the hepatic function tests were normal.

Thus, epidemiological studies have not documented human health effects that can consistently be associated with PCB exposure. While there is suggestive evidence for subclinical increases in serum hepatic enzymes, these changes may in reality be indicators

of microsomal enzyme induction and not non-reversible hepatic lesions. Dermatological effects such as rashes and chloracne have not been consistently related to serum PCB levels.

PCB exposure in laboratory animals produces similar effects to those seen in humans. For example, effects seen in animals following PCB exposure include microsomal enzyme induction, increased serum levels of liver associated enzymes, liver enlargement, and fat deposition with the liver. Many of these changes appear to be reversible, as reversible degenerative lesions of the liver were noticed in rats, mice, rabbits, cats and guinea pigs exposed to 1.5 mg/m³ (0.11 mg/kg) Aroclor 1254 vapor for 7 hours a day, 5 days a week, for 213 days (Treon et al., 1956). Sprague-Dawley rats fed a diet containing a mixture of PCB congeners at a concentration of 100 mg/kg for 52 weeks appeared healthy and gained weight as rapidly as the control animals throughout the study; however, there were other distinct changes. There was an increase in total serum lipids and cholesterol, as well as liver hypertrophy and focal areas of cellular degeneration (Allen et al., 1976).

Female monkeys have been fed diets containing Aroclor 1248 at concentrations of 2.5, 5.0, and 25.0 mg/kg for time periods ranging from 2 months for the 25.0 mg/kg dose to 1 year for the 2.5 and 5.0 doses (Allen et al., 1974; Barsotti and Allen, 1975). Monkeys receiving the 25 mg/kg dose developed facial edema, alopecia, and acne within 1 month, and one animal died from PCB intoxication two months after being removed from the diet. These monkeys also developed hyperplastic gastritis, which is a possible PCB-related effect that appears to be unique to monkeys. The surviving monkeys from this experiment continued to show clinical signs of PCB toxicity 2 years following the exposure. Infants born to these females were smaller than normal and had detectable levels of PCBs in their tissues. Of the laboratory animals, monkeys are considered to be the most sensitive to PCB effects (ATSDR, 1989a).

The National Cancer Institute (NCI, 1977) conducted a chronic feeding study in male and female rats. Rats were given 25, 50, and 100 mg/kg Aroclor 1254 in the diet for 104-105 weeks. While mean body weights for all females and for mid- and high-dose males were below controls by week 10, other symptoms such as alopecia, facial edema, and exophthalmos did not appear until week 72, and then only in the high-dose group. In the

mid-dose (50 mg/kg), these symptoms did not appear until the end of the study (week 104). Nodular hyperplasia (non-neoplastic) was noted in a dose-related frequency in both male and female rats at all dose levels. Hepatocellular carcinomas were observed in mid- and high-dose males, and hepatocellular adenomas were observed in mid- and high-dose males and females. However, the incidence of these tumors were not statistically significant. It was thus concluded that under the conditions of this study, Aroclor 1254 was not carcinogenic in Fisher rats.

8.3.1.1.1 Reference Dose (RfD) for Aroclor 1248

As previously indicated, a recent reevaluation of toxicological data of Aroclors 1242 and 1254 suggests that Aroclor 1248, like Aroclor 1242 and Aroclor 1254, should be treated as a noncarcinogen (Moore, 1991). However, because no regulatory guidance exists on an appropriate RfD for Aroclor 1248, an RfD has been developed for this risk assessment. The approach adopted was an extensive review of the literature to identify key studies which had sufficient information regarding dose and effect, if any, such that it would be possible to generate either a "no observed adverse effect level" (NOAEL) or the "lowest observed adverse effect level" (LOAEL).

In dose-response experiments, the NOAEL is defined as the exposure level (or dose) at which there is no significant increase in adverse effects in the experimental population as compared to control. While some effects may be noted at this dose level, the effects are considered neither adverse in themselves nor precursors to adverse effects. When more than one NOAEL is noted in a particular study, the highest NOAEL is considered the appropriate NOAEL. On the other hand, the LOAEL is defined as the lowest exposure level in a dose-response study at which there are significant increases in the frequency or severity of adverse effects in the experimental population as compared to the control population. The NOAELs and LOAELs from dose response studies are then used to estimate an appropriate RfD. The RfD, which is an estimate of daily intake that is likely to be without appreciable risks of deleterious effects during a portion of a lifetime, is developed by dividing the NOAEL (or LOAEL if the NOAEL is not available) by an uncertainty factor. The uncertainty factor reflects professional judgement regarding different

types of data used to estimate the RfD. For example, a 10-fold factor of uncertainty might be assumed in the following situations:

- To account for variations in human sensitivity in the general population following data extrapolation from human studies
- To extrapolate from long-term animal studies to humans
- To extrapolate from sub-chronic studies in animals to chronic effects
- To extrapolate from a LOAEL to a NOAEL

In some cases, based on professional judgment, other uncertainty factors may be included or the 10-fold factors typically used may be modified to account for perceived uncertainty in animal sensitivity versus human sensitivity. Thus, when uncertainty factors that reflect the uncertainty inherent in the extrapolation process are applied to NOAELs and LOAELs, health-protective RfDs can be derived.

Table 8.4 is a summary of the data used to derive an RfD of 2.28E-4 mg/kg/day for the non-carcinogenic effects of Aroclor 1248. Studies used to derive this RfD used Aroclor 1248. The pertinent LOAELs and NOAELs of each study are presented along with the rationale for the selection of uncertainty factors. To determine the final RfD, the geometric mean of the five study-based RfDs was calculated. The geometric mean of this data is used because it places equal weight on relative changes in magnitude within the data set.

8.3.1.2 Carcinogenic Properties of PCBs

The potential carcinogenicity of PCBs in man has not been clearly established. Epidemiological studies have yielded inconclusive results due to problems such as small cohort size, inability to quantify PCB exposure, and the likelihood of worker exposure to other potential carcinogens. Brown and Jones (1981) performed a retrospective cohort mortality study on over 2,000 workers who had been employed at least 3 months in two capacitor factories using Aroclors 1254, 1242 and 1016. Mortality from all causes was lower than expected in this study. However, while excess mortality from liver and rectal cancer was noted, this excess was not statistically significant. Studies on both research personnel

and plant workers at a petrochemical plant where Aroclor 1254 had been used for 9 years were performed (Bahn et al., 1976, 1977; Lawrence, 1977; NIOSH, 1977). NIOSH (1977) noted that a greater-than-expected number of cancers occurred in this population, as 8 cancers were noted compared to an expected 5.7. However, this data should be considered inconclusive not only because of the small cohort size and lack of PCB exposure quantification, but also because of the confounding influences from likely worker exposure to other potential carcinogens.

The USEPA has based its evaluation of the carcinogenic potential of PCBs on the study conducted by Kimbrough (1975) and more recently, on the Norback and Weltman (1985) study. Both of these studies were long-term feeding studies utilizing a single level high dose of Aroclor 1260 in different strains of rats. In the Kimbrough (1975) study, 200 female Sherman rats were fed 100 mg/kg Aroclor 1260 in the diet for 21 months. After 23 months, all remaining animals (184) were killed and examined. Of the 184 treated females, 170 had elevated tan nodules on the surface and interior of their livers, and these nodules were characteristic of neoplastic nodules. Hepatocellular carcinomas of the trabecular type were noted in 26 of the 184 treated animals, but in only 1 of the 200 control animals.

In the Norback and Weltman (1985) study, 70 male and 70 female Sprague-Dawley rats received 100 mg/kg Aroclor 1260 in the diet for 16 months. Then, because of evident toxicity, the dose was reduced to 50 mg/kg for 8 months, and finally a control diet was provided for the final 5 months prior to sacrifice. The female rats exhibited a significantly elevated cancer rate over the males. Periodic sacrifices were also performed, and even after 1 month of the dietary treatment, hepatomegaly was noted in these rats. Pathologic changes were noted in the livers that progressed from hypertrophy to adenocarcinoma. However, while these tumors met morphologic criteria for carcinoma, they were biologically unaggressive, as neither metastasis nor invasion of surrounding tissues occurred. Additionally, the rats did not exhibit increased mortality that could be attributed to the presence of these tumors.

8.3.1.2.1 Carcinogenic Potency Factor (CPF) for Aroclor 1260

Quantitative carcinogenic risk assessments, using mathematical extrapolation models such as the linearized multistage model, are used by the USEPA to estimate CPFs. These CPFs are upper bound risk estimates, such that the true cancer risk to humans would not be expected to exceed this value. The USEPA developed a CPF for PCBs of $7.7 \text{ (mg/kg/day)}^{-1}$ using the Norback and Weltman (1985) study as a basis for a quantitative carcinogenic risk assessment. However, recent data indicate that a CPF of $1.9 \text{ (mg/kg/day)}^{-1}$ is more appropriate (Moore, 1991). For purposes of this risk assessment, the current USEPA CPF of $7.7 \text{ (mg/kg/day)}^{-1}$ will be used to estimate potential carcinogenic risk associated with exposure to Aroclor 1260.

8.3.2 Nonylphenol and Dodecylphenol

Nonylphenol and dodecylphenol are used in various manufacturing processes, such as the production of non-ionic surfactants and the synthesis of stabilizers and antioxidants for rubber and plastic manufacturing. Nonylphenol has also been used as a vehicle in pesticide formulations (McLeese et al., 1980) and dodecylphenol has been identified among the volatile emissions resulting from rubber manufacturing (Cocheo et al., 1983).

Data on the toxicology of these phenols are not extensive. Most of the available information concerns their potential environmental effects primarily on aquatic fauna. Because of its hydrophobic properties, nonylphenol may bioaccumulate. Several studies have been conducted to determine some LC_{50} values for nonylphenol. The LC_{50} value is defined as the concentration of a compound that is lethal to 50 percent of a population. Thus, a 48-hour LC_{50} value is the concentration of a compound that is lethal to 50 percent of the population in 48 hours. The 48-hour LC_{50} of nonylphenol in fathead minnows was found to be about $160 \text{ } \mu\text{g/L}$, and the 96-hour LC_{50} was approximately $140 \text{ } \mu\text{g/L}$ (Holcombe et al., 1984). McLeese et al. (1980) investigated the role of nonylphenol in a pesticide formulation. Because the 96 hour LC_{50} of nonylphenol in salmon was found to be $900 \text{ } \mu\text{g/L}$, McLeese et al. (1980) concluded that nonylphenol was not an inert vehicle in the pesticide formulation.

Monsanto has conducted several studies to determine acute and sub-acute animal toxicity resulting from exposure to these phenols. Studies conducted included both range-finding and sub-acute feeding studies, and *in vitro* studies. In a 20-day feeding study, pregnant CD rats were given doses of 125, 250, 500, 1000, and 2000 mg/kg/day of dodecylphenol. Rats in the two highest dose groups died, and one female in the 500 mg/kg/day dose group experienced a uterine resorption. The only other effect observed was that all the rats except those in the 125 mg/kg/day had a soft stool. No adverse effects from treatment were evident based on the examinations and evaluations at doses of 125 mg/kg/day (Bio/dynamics, Inc., 1985).

In a 4-week feeding study (Monsanto Agricultural Company Environmental Health Laboratory, 1988) at dietary concentrations of 0, 500, 2500 and 5000 mg/kg dodecylphenol using Sprague-Dawley rats, the no observed effect level (NOEL) was determined to be 500 mg/kg, based on the observation that rats in this lowest-dose group did not exhibit a decrease in either food intake or body weight gain. Using data on food consumption and body weight, the average dose was determined to be about 74 mg/kg/day. Another 20-day feeding study was conducted with CD female rats to determine any potential reproductive effects of dodecylphenol (Bio/dynamics, Inc., 1987). Doses given were 20, 100 and 300 mg/kg/day. No treatment related effects were seen in the rats at the 20 and 100 mg/kg/day doses. However, at 300 mg/kg/day, dodecylphenol was found to be maternally toxic, embryotoxic and fetotoxic. Effects noted in this group were a decrease in the mean number of viable fetuses, an increase in the mean number of uterine resorption sites, a decrease in both maternal body weight gain and fetal body weight, and a delayed development of fetal ossification processes.

In vitro mutagenicity assays were also conducted for nonylphenol and dodecylphenol. In all *in vitro* assays, both nonylphenol and dodecylphenol were not found to be mutagenic (Hazleton Biotechnologies Corp., 1984; Monsanto Company Environmental Health Laboratory, 1987).

Based on information received from Monsanto, there are no studies for nonylphenol equivalent to the dodecylphenol feeding studies. Other than *in vitro* studies the only

information about nonylphenol that is apparently available is an acute range-finding study for lethality (Younger Laboratories, 1959, 1974, 1978). Based on the data available (Younger Laboratories, 1959, 1974, 1978), it was estimated that a dose of 1390 mg/kg of nonylphenol was expected to result in a 50 percent lethality (LD_{50}). This compares with an estimated LD_{50} for dodecylphenol of 6700 mg/kg. Thus, it would appear from this very limited information that nonylphenol may be about 5 times more toxic than dodecylphenol.

8.3.2.1 Reference Doses (RfDs) for the Phenols

Based on the current information on dodecylphenol and nonylphenol both of these compounds should be treated as noncarcinogens. Thus, it is appropriate to develop RfDs that provide an estimate of reasonable levels of exposure to these compounds which will not result in adverse effects. For dodecylphenol, only three sub-acute studies can be considered appropriate to use for the development of an RfD. Two of these are reproductive studies where dodecylphenol has been administered to pregnant rats, while the third study in both male and female rats was a 28-day feeding study. Each of these studies has been carefully examined to derive a LOAEL and, hence, NOAEL. It should be noted that in the feeding study the individual food consumptions and body weights were used to obtain average doses by sex and dietary concentration of the compound. Male and female data were combined to provide average dose levels that were then used for defining the NOAEL.

The process for deriving an RfD has previously been described for PCBs (Section 8.3.1.1). The analysis of the three short term dodecylphenol studies and the estimated RfD derived from each of those studies is shown in Table 8.5. The studies have then been combined to provide an average RfD of $3.93E-2$ mg/kg/day. For the purposes of estimating a hazard index in the risk characterization the estimated RfD is rounded to $4E-2$ mg/kg/day.

As stated previously in Section 8.3.2, nonylphenol has been estimated to be about 5 times more toxic than dodecylphenol. Based on this estimate, the RfD for nonylphenol would be about $7.86E-3$ mg/kg/day. For estimating the hazard index in the risk characterization the estimated RfD is rounded to $8E-3$ mg/kg/day.

8.3.3 Polynuclear Aromatic Hydrocarbons (PAHs)

PAH compounds are commonly occurring by-products of ordinary combustion. For example, they are produced by forest fires, cigarettes, motor vehicles, incinerators, cooking and open burning. Many of these compounds are also found in petroleum based fuels. Structurally these chemicals are a series of unsaturated, six-carbon rings that are joined together. When the rings of the PAHs are in a particular configuration, some of the compounds are potentially carcinogenic based on animal studies. When the rings lack that particular configuration the compounds are generally considered to be noncarcinogenic. Based on work published by Chu and Chen (1984) and ICF Clement Associates (1988) the potentially carcinogenic PAH compounds detected at the site are benzo(a)pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and dibenzo(a,h)anthracene.

PAHs released to the atmosphere are subject to being transported over both short- and long-distances. They are removed from the atmosphere by wet and dry deposition. In surface waters, PAHs can, in general, volatilize, photodegrade, oxidize, biodegrade, bind to particulates or accumulate in aquatic organisms. Bioconcentration factors range from 100 to over 2000. In both soils and sediments, PAHs can biodegrade or accumulate in plant material (ATSDR, 1989b). Migration of PAHs to ground water can occur either as a result of surface-water recharge or from soils containing elevated PAH compounds. Lateral transport of these compounds within aquifers have been reported (ATSDR, 1989b). At the Monsanto Kearny site there is a complex mixture of several PAHs, and thus, no conclusions can be reached on anticipated half-lives in either soil, sediments or water (if present).

In the atmosphere, PAHs can undergo photo-oxidation forming diones, nitro-PAHs and sulfonic acids. Half-lives of the PAHs in the atmosphere are estimated to be less than 30 days (ATSDR, 1989b). In water, the most important processes are photo-oxidation, chemical oxidation and biodegradation. The rate and extent of degradation is dependent on factors such as temperature, water depth and turbidity. In the presence of oxygen, PAHs can be significantly metabolized by microbes, and algae can also transform PAHs to oxides and peroxides. Microbial degradation is also known to occur in soil with the formation of

dihydrodiols as intermediates which further degrade to catechol and several organic acids such as acetic, fumaric, pyruvic and succinic acid (ATSDR, 1989b).

The transport and partitioning of the PAHs in the environment is dependent on physicochemical properties, such as water solubility, the organic carbon-water partition coefficient (K_{oc}), and the octanol-water partition coefficient (K_{ow}) of the individual components. Coefficients such as K_{oc} provide a measure of the extent of chemical partitioning between organic carbon and water. Because K_{ow} provides a measure of the extent of chemical partitioning between water and octanol, it can be used to predict bioconcentration in aquatic organisms. Many of the properties of these compounds are related to molecular weight.

8.3.3.1 Carcinogenic Potency Factors (CPFs) for PAHs

Humans are exposed to PAHs in the form of complex mixtures rather than single compounds. As such, human data on the toxicity of specific PAHs is not available. Thus, in order to obtain some estimate of the human hazard associated with PAHs, animal studies are used. With the exception of benzo(a)pyrene (B(a)P) there are very few long term animal studies associated with PAHs. While B(a)P has been administered to several animal species by several routes of administration, the majority of PAHs have only been tested using the mouse skin assay. Thus, for the PAHs for which there is evidence of carcinogenic activity there is insufficient data to reasonably estimate a CPF. Chu and Chen (1984) and ICF Clement Associates (1988) have proposed methodologies for expressing the toxicity of carcinogenic PAHs in terms of B(a)P equivalents. The methodology adopted in each case by these respective authors was to compare the relative potency of each carcinogenic PAH they studied to B(a)P using all the relevant available information for that PAH. Even though these authors examined some of the same papers to develop their respective PAH potency ratios, differences do exist between these methodologies. While this risk assessment is not an appropriate forum to detail these differences, the values calculated by ICF Clement Associates (1988) are, in general, the more conservative of the two values. Thus, the values calculated by Chu and Chen (1984) are used in the REI exposure scenarios, and the values calculated by ICF Clement Associates (1988) are used in the MEI exposure

scenarios. Table 8.6 indicates the relative potencies of the carcinogenic PAHs at the site according to the methodologies of both authors.

Since it is believed that all PAHs act at the same target cells to express a carcinogenic response, by representing carcinogenic activity of PAHs in terms of B(a)P equivalents an estimate of risk associated with these compounds can be determined.

Although the Carcinogen Assessment Group (CAG) of the USEPA has classified B(a)P as a probable human carcinogen, (Group B2), the Health Effects Assessment Summary Tables (HEAST) does not provide a CPF for B(a)P (USEPA, 1990a). Because an oral CPF for B(a)P is currently unavailable, the former oral CPF of $11.5 \text{ (mg/kg/day)}^{-1}$ given in the Superfund Public Health Evaluation Manual (SPHEM) will be used (USEPA, 1986). There is no RfD published for B(a)P.

8.4 Human Exposure Assessment

The purpose of the exposure assessment is to estimate the magnitude and frequency of possible exposure to site-related chemicals and the potential intakes that may result from such exposures. Because the exposure assessment also estimates potential intakes, which in turn are used to estimate risk, a two-case approach can provide a measure of the range of uncertainty associated with these estimates. This approach involves defining both an average and upper bound exposure scenario. The average exposure scenario will be developed by defining a "reasonable exposed individual" (REI) and the upper bound exposure scenario will be developed by defining a "maximum exposed individual" (MEI).

At the Monsanto Kearny Plant, it is assumed that the only likely human receptors are employees assigned to work at the Monsanto Kearny Plant. As previously stated, two exposure scenarios (namely the REI and MEI) are used in this risk assessment to describe potential exposures at the site. Exposure assumptions for the REI define the exposures associated with the most likely activities at the site, and the exposure assumptions for the MEI define the upper bound of any potential exposures. At the Monsanto Kearny Plant, chemicals of potential concern have been identified only in surface soils (Section 8.2.4). The

following sections describe the assumptions and the estimated intakes of chemicals of concern by the REI and the MEI associated with exposure to surface soils.

8.4.1 Reasonable Exposed Individual

Receptors may contact the chemicals of potential concern present in the soil through the exposure routes of ingestion, dermal absorption, or inhalation. Typical employee activities at the site include the potential for dermal contact by workers with site soils. In both the REI and MEI exposure scenarios, normal hygienic standards are assumed to occur in the workplace. However, the potential for dermal absorption of chemicals does exist. Although air sampling data at the site indicated that neither PCBs nor TSPs could be detected in air collected at the site (Section 8.2.3), fugitive dust originating from surface soils may be generated, particularly during digging activities. This health-protective evaluation of chemicals of potential concern in surface soils includes an estimate of exposure to fugitive dust derived from these soils. Thus, the potential exposure routes for a worker at the site under the REI scenario are dermal exposure and inhalation. Workers are assumed to be employed at the site for 10 years for this scenario.

PCBs are known to undergo environmental degradation, meaning that the concentration of PCBs present in the environment decreases with time. In the REI scenario, PCBs are assumed to have a half-life of 5 years. The half-life of a compound is an exponential relationship that describes the length of time that is required for half of the initial amount

of the compound present to dissipate or degrade. The amount of the compound present at any given time is determined by the following equation:

$$A = A_0 e^{-\gamma t} \quad (\text{Equation 8-1})$$

Where:

- A = Amount of compound remaining at end of time interval 't'
- A₀ = Original amount of compound present
- e = Base of the natural logarithm
- γ = Half-life
- t = Elapsed time (years)

Calculations of PCB concentrations are based on the above equation, with resulting concentrations rounded to three significant figures. The following sections describe the individual assumptions associated with the two exposure routes for the REI scenario.

8.4.1.1 Assumptions for Dermal Exposure

Dermal exposure is assumed to occur only when digging activities are conducted, and these activities are assumed to be conducted no more than 20 days per year. Each digging episode is assumed to last the entire day, such that worker exposure is 8 hours per day, per digging episode. The dust generated during these activities is assumed to contact the skin on the hands, forearms, head and neck at a thickness of 0.2 mg/cm² (Sedman, 1989). The body surface area of the average adult is 18150 cm² (USEPA, 1989b). The hands, forearms, head and neck areas that are assumed to come in contact with the dust comprise about 17% of the total body area (USEPA, 1989b).

To estimate potential intakes from dermal exposure, information regarding absorption of chemicals across the epidermis is necessary. Absorption of PCBs across the epidermis is based on the work of Wester et al. (1990). Wester et al. determined that dermal absorption of compounds with a log K_{ow} similar to PCBs was about 1 percent over a 24-hour period. Assuming an 8-hour exposure period in this REI scenario, 0.33 percent of PCBs on the skin will be absorbed per exposure event. Kao et al. (1985) studied *in vitro* percutaneous absorption of B(a)P and testosterone in skin samples from six mammalian species including man. Percutaneous permeation of pure benzo[a]pyrene dissolved in acetone was

approximately 3 percent over 24 hours (or 1 percent over 8 hours) in fresh human skin. Because PAHs present in the soil will be strongly bound to soil particulates and vehicles such as acetone that promote absorption will be absent in soil, dermal absorption of PAHs from the soil will be much less than that observed by Kao et al. (1985). To make a reasonable health-protective assumption regarding dermal absorption, 0.1 percent of PAHs present in soils that have adhered to skin are assumed to be absorbed during an 8-hour period. A health-protective absorption factor of 10 percent will be used for nonylphenol and dodecylphenol due to their lipophilic and hydrophobic properties.

Soil concentrations for each of the chemicals of potential concern in surface soils were established as the geometric mean values from the data set. The geometric mean measures the central tendency of data expressed in relative terms, and is considered an appropriate estimation of site-wide chemical concentrations when data is apparently highly skewed and reveals the existence of "hot spots" on the site. However, based on the fact that PCBs undergo environmental degradation, PCB concentrations will decrease through time. Using the site geometric mean concentrations for Aroclors 1248 and 1260 as initial concentrations, Table 8.7 shows the decline in PCB concentrations over a 10-year period assuming a 5-year half-life. Because workers would come into contact with decreasing concentrations of PCBs during the course of 10 years, the average concentration of PCBs present during this time period should be used in the exposure calculations. The average soil PCB concentration for 10 years is equivalent to the amount present in the soil at the fifth year. Beginning with the geometric mean value of $5.60\text{E}+0$ mg/kg for Aroclor 1248, the amount remaining at 5 years is $2.80\text{E}+0$ mg/kg, and beginning with the geometric mean value of Aroclor 1260 of $8.93\text{E}+0$ mg/kg, the amount remaining at 5 years is $4.47\text{E}+0$ mg/kg. Thus, these two numbers are the designated values for the exposure models. Although environmental degradation of nonylphenol, dodecylphenol and PAHs is also likely to occur, there is not sufficient information to allow for any estimation of their half-lives. Thus, these compounds are not considered to undergo exponential environmental degradation.

As previously stated, the REI scenario assumes that Aroclor 1248 is noncarcinogenic, and Aroclor 1260 is carcinogenic. Because PCBs are known to accumulate in body fat, it is reasonable to estimate an average lifetime daily dose for Aroclor 1248 to determine whether

any noncarcinogenic effects have the potential to appear. An estimated lifetime daily dose is also calculated for nonylphenol and dodecylphenol, as they are noncarcinogens. Estimated lifetime daily doses will also be calculated for PAHs and Aroclor 1260, but they are evaluated as having carcinogenic potentials.

The model adopted for estimating potential intake by dermal absorption is derived from The Exposure Factors Handbook (USEPA, 1989b). Based on the assumptions stated above, the following equation was used:

$$LDID_{\text{dermal}} = (CS) (SA) (PA) (A) (F) (AF) (DE) (EY) / (DY) (LT) \quad (\text{Equation 8-2})$$

Where:

| | | |
|------|---|------------------------------------------------------------------------------------------------------|
| LDID | = | Estimated lifetime average daily intake by dermal absorption (mg/day) |
| CS | = | Concentration of chemical in soil, based on geometric mean; PCBs include estimated half-life (mg/kg) |
| SA | = | Total body surface area (18150 cm ²) (USEPA, 1989) |
| PA | = | Percent of SA that is contact area (17 percent) (USEPA, 1989) |
| A | = | Soil adherence to skin (0.2 mg/cm ² /day) (Sedman, 1989) |
| F | = | Factor for converting kilograms to milligrams (1 x 10 ⁻⁶) |
| AF | = | Absorption factor |
| DE | = | Days exposed in a year (20) |
| EY | = | Number of years exposed (10) |
| DY | = | Total days per year (365) |
| LT | = | Average lifetime (70 years) |

The estimated potential average daily intake of the identified chemicals of concern by dermal absorption based on an average lifetime daily intake, assuming no remedial activity, is shown in Table 8.8. The assumptions used are shown in the notes to the table. A discussion of the estimated risk, based on average daily intake, is presented in Section 8.5.

8.4.1.2 Assumptions for Inhalation

As mentioned in Section 8.2.3, air monitoring at the site has not shown the presence of airborne particulates nor the presence of detectable levels of PCBs. However, to be health protective because the possibility of generating fugitive dust through digging activities exists, potential inhalation exposure is considered. Air monitoring involves the measurement of total suspended particulates (TSPs), which by definition, deals with all particulate matter

that may be suspended in air. When determining what portion of these particulates may be likely to be retained and absorbed by the lungs, PM₁₀, not TSPs, becomes the relevant parameter. PM₁₀ focuses on those particulates within TSPs that have an aerodynamic diameter of 10 microns (μm) or less. Thus, the PM₁₀ value represents that part of the total particulate that is likely to reach the lower portions of the respiratory tract and be absorbed by the pulmonary mucosa. The USEPA documentation on PM₁₀ emission factors (USEPA, 1990b) does not provide specific estimates for digging or construction activities. However, net downwind PM₁₀ concentrations from construction sites range from 124 to 17000 μg/m³ (USEPA, 1988b). Because potential digging activities at the site will not include large scale construction activities, the lower PM₁₀ value of 124 μg/m³ is used in this risk assessment.

Half (50 percent) of the inhaled material is assumed to be absorbed by the pulmonary tissue, and workers engaged in light physical labor are assumed to inhale 1.4 m³ of air per hour. As previously stated, exposure will be assumed to occur over an 8-hour work day for 20 events per year during a 10-year working life.

The equation for estimating the potential intake from inhalation is given by the following equation:

$$LDII_{\text{inhalation}} = (CS) (PM) (CF) (RV) (HD) (PF) (DE) (EY) / (DY) (LT) \quad (\text{Equation 8-3})$$

Where:

- LDII = Estimated lifetime average daily intake by inhalation (mg/day)
- CS = Estimated soil concentration of chemical (mg/kg)
- PM = Value for PM₁₀ (μg/m³)
- CF = Conversion factor for μg to kg (1E-9)
- RV = Respiratory volume (m³/hour)
- HD = Hours exposed per day (8 hours/day)
- PF = Pulmonary retention factor (0.5)
- DE = Days per year that exposure occurs (20)
- EY = Number of years exposed (10)
- DY = Total days per year (365 days)
- LT = Average lifetime (70 years)

The estimated potential average daily intake of the identified chemicals of concern by inhalation based on an average lifetime daily intake, assuming no remedial activity, is shown

in Table 8.8. The assumptions used are presented in the notes to the table. A discussion of the estimated risk, based on average daily intake, is provided in Section 8.5.

8.4.2 Maximum Exposed Individual

As previously stated, the MEI exposure scenario is included to provide an upper bound estimate of exposure conditions. As such, any potential exposures that are associated with this scenario should be viewed as above the range of likely exposures at the site.

Factors that are adjusted in the exposure scenario for the MEI include the use of the arithmetic mean plus 2 standard deviations for soil concentration values with a PCB half-life of 40 years. As seen in the REI scenario, PAHs, nonylphenol and dodecylphenol are not assumed to undergo any environmental degradation. Based on the 7 non-winter months available for outdoor work, and accounting for vacations and holidays, workers are assumed to work on the site for 137 days a year. Workers are assumed to be employed at the site for 40 years. As in the exposure scenario for the REI, the exposure scenario for the MEI assumes that Aroclor 1248 is noncarcinogenic and Aroclor 1260 is carcinogenic.

Additionally, the potential for workers to ingest chemicals of potential concern via swallowing inhaled soil particulates is considered. The following sections present the specific assumptions associated with each of these exposure routes.

8.4.2.1 Assumptions for Dermal Exposure

An estimate of the average daily dose associated with dermal exposure is derived using Equation 8-2. Aroclor 1248 and 1260 soil concentrations are calculated using a 40 year half-life with initial concentrations equal to the values of the arithmetic mean plus two standard deviations for the top 2 feet of soil. Table 8.7 presents the amount of each Aroclor, using Equation 8-1, that can be expected to be present at the site at the end of selected years spanning years one to 40. As previously stated, because the amount of PCBs present declines through time, an average concentration over the 40 year exposure period is representative of actual soil concentrations. With an exposure period of 40 years, this

average value occurs at the end of year 20. The values of $1.00\text{E}+3$ mg/kg and $1.44\text{E}+2$ mg/kg are the soil concentrations of Aroclor 1248 and Aroclor 1260, respectively, that are present in soil at the end of year 20. Thus, they become the soil concentrations used in Equation 8-2.

Based on theoretical estimates of dermal absorption from soil, following deposition on the skin, of biphenyl and compounds that have some structural similarity to PCBs, a dermal absorption factor of 1 percent is used for PCBs in this MEI exposure scenario (Howd and McKone, 1991). Because PCBs present in the soil will tend to remain tightly bound to soil particulates, dermal absorption of PCBs from soil is generally low. Thus, a 1 percent absorption factor represents an upper-bound estimate. Furthermore, the amount of soil deposited on the skin in the MEI exposure scenario is assumed to be 0.5 mg/cm^2 (Sedman, 1989). Table 8.9 presents the estimated intakes associated with dermal absorption for the MEI.

8.4.2.2 Assumptions for Inhalation

Equation 8-3, used to estimate intake from inhalation in the REI scenario, is also used to estimate intake from inhalation in the MEI exposure scenario. As mentioned in Section 8.4.1.2, the PM_{10} value is appropriate to estimate the exposure from inhalation. The PM_{10} concentrations that workers under the MEI scenario could potentially be exposed are estimated using both the regional PM_{10} data and construction site PM_{10} data. Of the 137 non-winter working days, it will be assumed that during approximately 10 percent of these days (i.e., 14 days), PM_{10} concentrations will be $124 \mu\text{g/m}^3$. This $124 \mu\text{g/m}^3$ value is equal to the PM_{10} estimated for light construction activities. During the remaining 123 work days, PM_{10} concentration will be assumed to be $38 \mu\text{g/m}^3$, the regional average (USEPA, 1990b). The weighted average of these values is a PM_{10} value of $47 \mu\text{g/m}^3$. The remaining inhalation parameters remain the same for the MEI as for the REI. Table 8.9 represents the estimated intakes associated with inhalation.

8.4.2.3 Assumptions for Ingestion

As in the REI scenario, the personal hygiene habits of workers, such as hand washing prior to eating, are assumed to preclude accidental ingestion of soil particles adhering to the hands. However, ingestion of soil particles onto which chemicals have adsorbed may occur if inhaled particulate matter deposited in the upper respiratory tract is swallowed. As mentioned in Section 8.4.1.2, total suspended particulates (TSPs) relate to all airborne suspended particulates. Thus, TSPs become the relevant parameter when determining the particulate matter that may remain in the upper nasopharyngeal region and be available for swallowing.

The USEPA provides air quality data for each Metropolitan Statistical Area (MSA) in the United States which includes measurements of such parameters as PM_{10} , ozone, carbon monoxide and sulfur oxides (USEPA, 1990b). In 1988, Newark, New Jersey, the metropolitan area closest to the site, was found to have a PM_{10} value of $38 \mu\text{g}/\text{m}^3$ (USEPA, 1990b). The USEPA also measured over a period of two years (1987-88) both the PM_{10} and TSPs at 63 locations across the United States to determine what portion of the TSPs is due to PM_{10} . They found that from 1987 to 1988, the PM_{10} portion of TSPs declined from 59 percent to 56 percent. For purposes of this risk assessment, based on 1988 data, PM_{10} is assumed to make up 56 percent of TSPs. Using the Newark, NJ PM_{10} value of $38 \mu\text{g}/\text{m}^3$, a TSPs value of $67.8 \mu\text{g}/\text{m}^3$ is estimated. This value is used for estimates of fugitive dust ingestion.

It is also assumed that 50 percent of the inhaled particles will be swallowed and that all of the swallowed material (100%) will be absorbed across the gastrointestinal tract. Based on these assumptions, the equation for ingestion of inhaled materials becomes the following:

$$\text{LDIG}_{\text{ingestion}} = (\text{CS}) (\text{TSP}) (\text{CF}) (\text{RV}) (\text{HD}) (\text{PF}) (\text{GI}) (\text{DE}) (\text{EY}) / (\text{DY}) (\text{LT})$$

(Equation 8-4)

Where:

| | | |
|------|---|------------------------------------------------------------------------------------|
| LDIG | = | Estimated lifetime average daily intake by ingestion of inhaled particles (mg/day) |
| CS | = | Estimated soil concentration of chemical (mg/kg) |
| TSP | = | Value for total suspended particulates (TSPs) ($\mu\text{g}/\text{m}^3$) |
| CF | = | Conversion factor for μg to kg ($1\text{E}-9$) |
| RV | = | Respiratory volume (m^3/hour) |
| HD | = | Hours exposed per day (8 hours/day) |
| PF | = | Pulmonary retention factor (0.5) |
| GI | = | Gastrointestinal absorption factor (1) |
| DE | = | Days per year that exposure occurs (137) |
| EY | = | Number of years exposed (40) |
| DY | = | Total days per year (365 days) |
| LT | = | Average life time (70 years) |

Table 8.9 provides the estimated intakes that potentially result from this exposure scenario.

8.4.3 Summary of Estimated Intakes

Estimated intakes for each of the chemicals of potential concern under the REI and MEI exposure scenarios are shown in Tables 8.8 and 8.9, respectively. Estimated lifetime average daily intakes are expressed in mg/kg/day, and are the sum of intakes from all relevant exposure routes divided by the adult body weight of 70 kg. Under the REI scenario, the estimated intakes of on-site PCBs (Aroclors 1248 and 1260) are in the range of $8.55\text{E}-10$ to $1.37\text{E}-9$ mg/kg/day. The estimated intake of PAHs in terms of B(a)P equivalents is approximately $1.80\text{E}-10$ mg/kg/day, and the estimated intakes of nonylphenol and dodecylphenol are zero. Under the MEI scenario, estimated intakes of all the chemicals of potential concern increase. For PCBs, intakes are estimated to be in the range of $7.11\text{E}-6$ to $4.92\text{E}-5$ mg/kg/day; for PAHs, intakes are estimated in the range of $9.64\text{E}-8$ mg/kg/day; and intakes of nonylphenol and dodecylphenol are estimated in the range of $4.27\text{E}-7$ to $5.84\text{E}-4$ mg/kg/day.

8.5 Risk Characterization

Health risk estimation quantitatively defines the general magnitude and range of human health risks posed by a defined set of circumstances. The precision of such estimates is limited by the size and quality of the data base and the assumptions that support the mathematical estimations of intake and effect. Often, these limitations can be overcome by defining a range of extremes. However, the overriding uncertainties associated with estimating risks that may result from any chemical exposure include the following:

- The extrapolation of toxic effects observed at the high intakes necessary to conduct animal studies to effects that might occur at the much lower, environmentally relevant intakes; and
- The extrapolation from toxic effects in animals to toxic effects in man (i.e., responses of animals may be different from responses of man).

The risk characterization integrates information on the presence of chemicals in site-related media, the known toxicity of those chemicals and the site-specific exposure scenarios described in Section 8.4. As previously mentioned in the exposure assessment, the exposure scenarios described are based on the most likely pathways by which defined receptors could be exposed.

The approach taken in this part of the risk assessment uses extremely health-protective assumptions that overestimate any potential risks. The biased approach for managing uncertainties has a magnifying effect on the outcome of the risk assessment process. Since each step builds on the previous one, the overall result of biased assumptions is to significantly overestimate risks. This approach compensates for risk assessment uncertainties and provides an ample margin of safety.

8.5.1 Selection of an Appropriate Incremental Lifetime Cancer Risk

Incremental lifetime cancer risk (also referred to as excess cancer risk) is defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years (USEPA, 1989a) as the result of exposure to a specific known carcinogen. It is expressed in terms of additional cancers, above the normal background, that might be anticipated as a result of specific exposure to an external influence such as exposure to a carcinogen in drinking water, food, or air. Thus, an incremental lifetime cancer risk of one in a million ($1\text{E-}6$) may be interpreted as an increase in the baseline (background) cancer incidence from 280,000 per million population (American Cancer Society 1988) to 280,001 per million population.

The Food and Drug Administration (FDA) considers incremental lifetime cancer risk of one in a million to be a *de minimis* or insignificant risk (FDA 1985a, 1985b). Similarly, the USEPA uses an incremental lifetime risk range of $1\text{E-}4$ to $1\text{E-}6$ when considering and selecting remedial alternatives in Superfund site cleanups (40 CFR Section 300.430). Travis et al. (1987) reviewed 132 federal regulatory decisions concerning environmental carcinogens to determine levels of risk that lead to agency action. For small populations, the individual *de manifestis* risk level (i.e. the level of "obvious risk" that always led to regulatory action) was about $3\text{E-}4$.

To add some additional perspective to the selection of an appropriate incremental lifetime cancer risk, Crouch and Wilson (1984) estimated incremental lifetime cancer risk associated with common natural exposure to cancer causing sources. For example, incremental lifetime cancer risks attributed to natural background radiation is about $1.4\text{E-}3$; cosmic radiation as a result of frequent commercial air travel is on the order of $7\text{E-}4$, and PAHs in ambient urban air is about $1.1\text{E-}3$. Thus, it may be concluded that typical exposures to ambient cancer-causing sources incur incremental lifetime cancer risk in excess of $1\text{E-}3$ (1 in a 1000).

8.5.2 Carcinogens

The known or suspected human carcinogenic compounds included in this risk assessment are the carcinogenic PAHs (expressed in terms of B(a)P equivalents) and Aroclor 1260.

Incremental lifetime cancer risk (ILCR) is derived from the estimated daily intake and a carcinogenic potency factor (CPF). Since information on the potential carcinogenic potency of chemicals in humans is generally not available, animal experimental data are used to derive a CPF.

The estimation of the ILCR is given by the equation:

$$\text{ILCR} = (\text{CPF}) (\text{DI}) \quad (\text{Equation 8-5})$$

where:

ILCR = Incremental lifetime cancer risk
 CPF = Carcinogenic potency factor (CPF) (mg/kg/day)⁻¹
 DI = Estimated average lifetime daily intake (mg/kg/day)

Tables 8.8 and 8.9 provide estimates of ILCRs from exposures to site-related chemicals under baseline conditions for the two different exposure scenarios described in Sections 8.4.1 and 8.4.2. It should be noted that the estimated ILCR is based on potential daily intake averaged over a lifetime and using potential exposure periods of 10 years for the REI and 40 years for the MEI.

Under baseline conditions the potential site carcinogenic risks for the REI, based on the presence of PAHs and Aroclor 1260 at the site, fall in the range of 2.07E-9 to 1.05E-8 (Table 8.8). Potential site carcinogenic risks for the MEI, based on the presence of PAHs and Aroclor 1260, fall in the range of 1.11E-6 to 5.47E-5 (Table 8.9).

8.5.3 Noncarcinogens

Constituents that pose a potential health threat other than cancer are evaluated in terms of their relative hazard when compared to acceptable daily intakes. In this risk assessment the noncarcinogenic compounds considered are Aroclor 1248, nonylphenol and dodecylphenol. Acceptable daily intakes for these compounds are derived from relevant animal dose-response data.

A hazard index may be defined as the ratio between the daily intake of a chemical and the RfD for that chemical. As previously stated, the RfD is commonly derived from animal experiments and is frequently obtained by estimating the NOAEL and applying a safety factor to extrapolate to man. The RfD values are derived from quantitative information available from studies in animals (or observations made in human epidemiological studies) on the relationship between intake and noncarcinogenic toxic effects. The RfD values are designed to be protective of sensitive populations. This process is clearly demonstrated in Tables 8.4 and 8.5 which show the development of RfDs for Aroclor 1248 and dodecylphenol, respectively.

The hazard index does not define dose-response relationships and its numerical value should not be construed to be a direct estimate of risk. The hazard index is only a numerical indication of the nearness to acceptable limits of exposure or the degree to which acceptable exposure levels are exceeded. As this index approaches unity, concern for the potential hazard of the mixture increases. Exceeding unity does not in itself imply a potential hazard; however, it does suggest that a given situation should be more closely scrutinized.

A hazard index (HI) is determined for noncarcinogens based on the ratio of the estimated daily intake to the RfD, such that:

$$HI = (DI) / (RfD) \quad \text{(Equation 8-6)}$$

where:

HI = Hazard Index (unitless)
 DI = Estimated daily intake (mg/kg/day)
 RfD = Reference Dose (mg/kg/day)

Hazard indices are estimated for the identified noncarcinogenic chemicals of concern under baseline conditions for the two exposure scenarios described in Sections 8.4.1 and 8.4.2. The estimated HIs for the REI scenario described in Section 8.4.1, assuming 10 years of occupational exposure, are shown in Table 8.8. The hazard indices associated with exposure to site-related materials for the MEI, as described in Section 8.4.2, are shown in Table 8.9.

8.6 Uncertainty Analysis

Human health risks posed by a defined set of circumstances may be evaluated quantitatively. The precision of these estimates is limited by the size and quality of the data base. Often, these limitations can be overcome by defining a range of extremes. However, there are varying degrees of uncertainty associated with the estimation of risks that may result from human exposure. These uncertainties have been compensated for throughout the risk assessment by making health-protective assumptions, where necessary. Specific areas of uncertainty include the following:

- Receptor population
- Chemical database
- Exposure estimates
- Toxicological data and risk characterization
- Complex interaction of uncertainty elements

The uncertainty elements and the steps taken to address them are reviewed in the following sections.

8.6.1 Receptor Population

To achieve the most realistic estimates of the range of potential risks, if any, posed by the presence of a site on which hazardous substances have been identified, more than one exposure scenario should be considered and modeled. Recognizing this variability, two different exposure populations were considered for the site. Worker populations were modeled for potential exposures at the site for both 10 and 40 years.

In each case the exposure scenario for the hypothetical receptors maximized exposures by the various exposure pathways to provide estimates of potential risk. In the case of the MEI, workers were assumed to be in contact with soil containing chemical concentrations at the mean plus 2 standard deviations during 40 years of employment. Clearly, this is an overestimate of both site-wide concentrations and likely length of employment.

8.6.2 Chemical Database

The toxicology of the chemicals of potential concern in this risk assessment is not well-defined. For nonylphenol and dodecylphenol, minimal information was available regarding toxicity, chemical or physical properties. The bulk of the information presented in this risk assessment regarding these surfactants came from contract laboratory studies. Unpublished data of this nature involves some degree of uncertainty.

However, while there is a large amount of published information dealing with PCBs and PAHs, there are still numerous inconclusive aspects regarding the toxicology of these chemicals. Studies of the chemical, physical and toxicological nature of PAHs are hindered by the fact that PAHs, while environmentally ubiquitous, almost always occur as mixtures of many PAHs. Thus, any toxicological effects that might be associated with PAHs can not easily be attributed to a particular PAH.

PCB studies have yielded inconclusive results as to the carcinogenic potential of PCBs. While a limited number of studies have shown Aroclor 1260 to have a carcinogenic potential, there is an equally strong body of scientific evidence showing that most PCB mixtures do not have a carcinogenic potential.

8.6.3 Exposure Estimates

The exposure assessment uses mathematical models that relied extensively on the availability of the chemicals for exposure via the different pathways. These models are helpful in providing a numerical approximation of a biological system's response given a particular set of input conditions and constraints. Any attempt to model a biological system incorporates some degree of uncertainty. A number of these uncertainties were mentioned during the description of each potential exposure scenario and the assumptions that were used to estimate possible intake of chemicals by different routes of exposure. Some of the key assumptions will be reviewed here to illustrate the consistently health protective bias built into the assumptions to compensate for uncertainty. Where reasonable approximations of

the site-specific scenario could not be estimated, conservative "default" values that erred on the side of overestimation of exposure were used.

Throughout the risk assessment the potential level of exposure to site-related chemicals was based on chemical concentrations in the soil equal to the geometric mean and the arithmetic mean plus 2 standard deviations for the REI and the MEI, respectively. In reality the geometric mean and mean plus 2 standard deviations are not representative of the range of concentrations that were detected. For example, in some areas of the site, the levels were one or more orders of magnitude below the site geometric mean and mean plus 2 standard deviations. Furthermore, organic materials present in the environment are known to undergo biodegradation over time. While this biodegradation has been factored into the assumptions for PCBs present at the site, none of these assumptions were made for PAHs and nonylphenol and dodecylphenol. Because these compounds are likely to undergo microbial degradation in the soil (ATSDR, 1989b), it is very health-protective to assume that workers will always be exposed to the initial soil concentrations.

Other factors in the exposure assessment that have erred on the side of conservatism include the likely level of exposure by inhalation to dusts. With the dusts, chemicals are assumed present in the surface soils. Furthermore, all respirable particulate matter that is likely to exist at the site is assumed derived from the site. However, ambient temperature, coverage of the ground with snow and frozen or rain-soaked soils will result in reduction of the level of any potential exposure.

Biological factors that will ultimately affect the presence of chemicals within the body include absorption factors through the lungs, skin and digestive tract. While animal studies that address absorption through the gastrointestinal tract and skin are usually carried out using pure material or the pure material dissolved in a solvent, the absorption of site-related materials will be significantly impacted by binding to the soil matrix. For each of these factors the assumptions used have been directed towards exaggerating potential intake.

8.6.4 Toxicological Data and Risk Characterization

The overriding uncertainties associated with the risk characterization (Section 8.5) are:

- The extrapolation of toxic or carcinogenic effects observed at the high doses necessary to conduct animal studies to effects that might occur at much lower, "real world" human intake; and
- The extrapolation from toxic effects in animals to toxic effects in humans (i.e., responses of animals may be different from responses of humans).

These extrapolations form the basis for the derivation of the factors used to estimate risks. The carcinogenic potency factors (CPFs) are derived using a weight-of-evidence approach to studies in the scientific literature. Due to the lack of epidemiological data for most chemicals, the evidence results from animal studies in which experimental groups were exposed in their lifetime to doses many times those normally found in the environment. In some cases only a single study is used in this derivation process.

The USEPA uses a prescribed protocol (USEPA, 1989a) to evaluate animal data to estimate human CPFs. The model used is the linearized multistage extrapolation model, which provides a mathematical approximation of the dose-response slopes. There are several equally feasible dose-response extrapolation models available; however, the one typically selected by both federal and state agencies as applied here is designed to define the highest upper bound risk condition. The results of this model most likely overestimate the actual risk.

Current scientific evidence indicates that, for many chemicals, biological alteration must occur to initiate cancer. Metabolic and pharmacokinetic differences between the test animals and humans are in general not considered in estimating human CPFs. In addition the high doses administered during animal studies may result in saturation effects in certain biochemical systems within the organism. These same effects may not be relevant at lower doses when the biochemical systems are not saturated. Thus, an additional level of uncertainty is added to the risk estimation process.

Even in cases where epidemiological data is available indicating a direct association between long-term occupational exposure to chemical concentrations that significantly exceed exposures anticipated from occasional exposure to these compounds, and a carcinogenic response, a level of uncertainty persists because exposures are not controlled or quantifiable in the sense of a laboratory experiment. It is usually impossible to both isolate exposure to a specific chemical and to predict the actual levels of exposure to that chemical or the time period during which exposure occurred. Partial exceptions to this statement include the mesothelioma resulting from asbestos exposure and angiosarcoma attributable to vinyl chloride, where actual exposure periods are known from employee records, but the only qualitative assessment of dose relates to the knowledge that only persons closely associated with the use of these compounds develop the lesions described. Thus, in other cases of cancers believed to be induced by chemicals, the effect(s) observed may actually result from the complex interaction of a mixture of chemicals.

For noncarcinogens, the RfDs, TLVs and other agency-established criteria and standards have been established in a similar manner. The degree of uncertainty that exists for these noncarcinogenic values is thus similar to the uncertainties associated with potential carcinogens.

To the degree possible, the federal and state agencies have taken such uncertainties into account when deriving RfDs, CPFs and other similar human response factors. This risk assessment uses the guidance of these Agencies in minimizing the uncertainties by using published standards and criteria to evaluate the risks posed by the site.

8.6.5 Complex Interactions of Uncertainty Elements

A site-specific risk assessment is ultimately an integrated evaluation of historical, chemical, analytical, environmental and toxicological data that is as site-specific as possible. To minimize the effects of uncertainties in the evaluation, each step is biased toward health-protective estimations. Since each step builds on the previous one, this biased approach more than compensates for risk assessment uncertainties. In addition, these calculations do

not represent currently existing exposures or health risks. Rather, they are estimations that may occur only if all the conservative assumptions are realized.

8.7 Future Use of the Site

As previously stated in Section 8.1 of the Baseline Human Health Risk Assessment, the Monsanto Kearny Plant is in an highly industrialized section of Kearny Point. A review of available zoning documents from Hudson County, NJ, confirms that this area has been zoned for general industrial and manufacturing purposes. The baseline human health risk assessment presented in the preceding sections considers continued operation of the site as a manufacturing facility in the absence of any remedial measures. However, it is prudent to consider other uses of the site in the event that Monsanto discontinues current manufacturing operations. Taking into consideration the location of the site, this section describes possible future use scenarios for the site and associated potential impact on human health.

Should Monsanto, at some time in the future, choose to discontinue current operations, likely future uses of the site would include industrial and/or manufacturing operations. Based on current land use and zoning it is highly unlikely that any residential or commercial construction will take place on the site at any time in the foreseeable future. Industrial and/or manufacturing development at the site is consistent with facilities already present on and adjacent to the site. In addition, part of the Monsanto site is currently leased to a trucking company as a terminal, thus it is also conceivable that conversion of the site into a trucking and/or warehouse facility could occur.

8.7.1 Construction of Warehouses or a Manufacturing Facility

The construction of a warehouse or a manufacturing facility at the Monsanto Kearny Plant would most likely include earthmoving activities, such as cut and fill, to prepare the site for construction. Because these activities would likely disturb surface soils, construction workers could possibly come into contact with site-related chemicals of potential concern. The

following sections develop a potential exposure scenario and estimate intakes that could be associated with construction activities at the site.

8.7.1.1 Exposure Scenario

Typical worker activities at the site during building construction include possible contact with the chemicals of potential concern via dermal absorption, inhalation, and ingestion of inhaled particulates. To ensure an adequate margin of health protection a worker will be assumed to be exposed to these exposure routes simultaneously. The geometric mean concentrations of the chemicals of potential concern in the surface soils are used to estimate exposure. As described in Section 8.4.1.1 these values are used as reasonable estimates of site-wide soil concentrations. Although PCBs were assumed to undergo environmental degradation in the Baseline Human Health Risk Assessment, according to the half-life relationship, a half-life will not be assumed in this scenario. To include a degree of health protection, it is assumed that the workers will contact the same chemical concentration for the entire duration of construction activities. As in the Baseline Human Health Risk Assessment, Aroclor 1248 is assumed to be noncarcinogenic and Aroclor 1260 is assumed to be carcinogenic.

Once begun, construction activities are assumed to occur continuously throughout the course of one year. Based on holidays, vacation, and sick days, the typical employee works 240 days a year. Thus, in this scenario, construction workers will be assumed to participate in on-site construction activities 8 hours a day for 240 days a year for the course of 1 year. Following is a more detailed description of each of the exposure routes.

8.7.1.1.1 Dermal Exposure

To estimate intake by dermal absorption Equation 8-2 (Section 8.4.1.1) is used. The upper bound estimate of soil deposition on skin of 0.5 mg/cm² is used to be health protective. Dermal absorption factors of 3.3E-3, 1E-1, and 1E-3 are used for PCBs, the phenols, and benzo(a)pyrene equivalents, respectively (see Section 8.4.1.1). Estimated intakes from

dermal absorption are averaged over a lifetime and are presented in mg/kg/day in Table 8.10.

8.7.1.1.2 Inhalation Exposure

Intake via inhalation is estimated using Equation 8-3 (Section 8.4.1.2). As previously stated (Section 8.4.1.2) workers are assumed to inhale 1.4 m³ per hour and to absorb half of the inhaled material across the pulmonary mucosa. However, the PM₁₀ value in this equation is adjusted to be both health protective and representative of construction activities. The USEPA (1988b) has measured PM₁₀ emission factors for construction sites. For earthmoving activities, defined as uncontrolled cut and fill activities, the PM₁₀ values ranged from 124 µg/m³ to 7,600 µg/m³. Because the difference between these values spanned several orders of magnitude, the geometric mean was determined to be the most representative of central tendency. The geometric mean of the four values provided (USEPA, 1988b) is 1320 µg/m³, and this is the PM₁₀ value used in the inhalation scenario. Table 8.10 presents the estimated lifetime average intakes of the chemicals of potential concern associated with inhalation.

8.7.1.1.3 Ingestion Exposure

Intake of chemicals of potential concern by ingestion of inhaled particulate matter is estimated using Equation 8-4 (Section 8.4.2.3). Assumptions regarding all the parameters in this equation with the exception of the days exposed per year and number of years of exposure remain as previously presented (Section 8.4.2.3). Table 8.10 presents the estimated intakes that could result from this ingestion exposure route.

8.7.1.2 Risk Characterization

As previously stated in Section 8.5 risk estimation defines the general magnitude and range of human health risks posed by a given set of circumstances. For carcinogens, this involves a determination of the Incremental Lifetime Cancer Risk (ILCR) (Section 8.5.2) and for noncarcinogens this involves a determination of the Hazard Index (HI) (Section 8.5.3).

Table 8.10 presents both the ILCRs and HIs for the appropriate chemicals of potential concern for the construction scenario presented in this Section. ILCRs posed by the carcinogenic compounds at this site according to the assumptions presented are in the range of $1.7\text{E-}8$ to $1.2\text{E-}7$. Hazard indices for the noncarcinogenic chemicals of potential concern at this site according to the assumptions presented are in the range of $5.9\text{E-}8$ to $4.5\text{E-}4$.

Uncertainties associated with the estimated risks are similar to those considered for the Baseline Human Health Risk Assessment. A detailed discussion of uncertainties is provided in Section 8.6.

8.7.2 Use of the Site as a Trucking Facility

As previously stated part of the Monsanto property on Kearny Point is currently leased and used as a trucking facility. It is known that when the leased land was developed a layer of crushed rock and several layers of asphalt were laid to form a base strong enough to support the truck traffic. If the Monsanto Kearny Plant was developed for a comparable purpose similar construction practices could be anticipated. This would result in all surface soils being permanently encapsulated beneath the site. Thus, in terms of impacts to human health, the construction of a trucking facility would present no potential for human contact with the chemicals of potential concern.

8.8 Summary and Conclusions

Soil, ground water and air were evaluated as media that could receive and/or transport the chemicals of potential concern present at the site. Because the chemicals of potential concern were not detected in ground water or air on any significant basis, only one medium, soil, is evaluated for this site. Furthermore, for purposes of this risk assessment, only surface soils are considered relevant. Three different potential exposure scenarios, based on both current use and future potential use of the site, were examined to determine the potential risks, if any, associated with the presence of chemicals in surface soils at the Monsanto Kearny Plant. The REI and MEI exposure scenarios deal with current use of the site, and the construction scenario describes the likely future potential use of the site. The

exposure scenarios were developed based on long term possible uses of the site and do not represent any known current exposure at the Plant.

The range of concentrations of the various chemicals of potential concern detected in site-related soils was sufficiently varied that an approach which bracketed the exposure and risk estimates for each exposure scenario was justified. By bracketing the estimates of risk, an upper bound of potential risk as well as a more likely estimate of risk are obtained. The use of the upper bound more clearly defines the presence of "hot spots" since it represents the potential exposures and risk associated with concentrations that are representative of 97.5 percent of all concentrations of each individual chemical reported for the site.

The exposure scenarios developed and the assumptions that are included in each exposure scenario are likely to exaggerate any potential exposure and risk associated with the site. For example, the assumption that workers would be employed at the Plant and come into contact with surface soils for 40 years is clearly not likely to occur. However, combining these assumptions allows for an additional level of health protection to be incorporated into the assessment. Furthermore, the inclusion of an exposure scenario for future potential use incorporates another level of health protection into the risk assessment.

In order to draw conclusions regarding the level of risk that may or may not be associated with this site, an acceptable level of risk for occupational exposures must be considered. Historically, regulatory agencies have promulgated occupational exposure limits with upper bound excess risks around the $1E-3$ risk level rather than the $1E-6$ risk level often associated with environmental regulations. For example, Occupational Safety and Health Administration (OSHA) permissible exposure levels (PELs) are time-weighted average concentrations of chemicals in air that must not be exceeded during any 8-hour work shift of a 40-hour work week (29 CFR 1910.1000; NIOSH, 1990). Applying the regulatory PELs (NIOSH, 1990) for three carcinogens, benzene, vinyl chloride and arsenic to an assumed working life of 40 years results in ILCRs in the range of $5.65E-3$ to $4.61E-2$. Reasons for this policy include the fact that occupational environments are controlled, that small populations are associated with given occupational exposure scenarios, and that "sensitive" populations are usually not present in the work force. Thus, the theoretical risks deemed

acceptable for occupational exposure have been greater than the risks deemed acceptable for residential or general environmental exposure.

Potential incremental lifetime cancer risks (ILCRs) due to the presence of PAHs and Aroclor 1260 at the Monsanto Kearny Plant fall in the range of $2.07\text{E-}9$ to $5.47\text{E-}5$ for the REI and the MEI exposure scenarios (Tables 8.8 and 8.9) and in the range of $1.77\text{E-}8$ to $1.19\text{E-}7$ for the construction scenario (Table 8.10). The USEPA considers acceptable incremental cancer risk for exposure of the general population to chemicals to be in the range of $1\text{E-}4$ to $1\text{E-}6$, as stated in the revised NCP (USEPA, 1990c). However, as stated previously, regulatory agencies have allowed higher above-background cancer risks for occupational exposures than for environmental exposures. Thus, because all exposure scenarios at the Monsanto Plant are strictly occupational, potential estimated risks, which are based on health-protective assumptions, are considered acceptable based on current Federal occupational regulatory guidance. Furthermore, should the estimated potential incremental cancer risks be applied to the more conservative environmental exposure standards, only Aroclor 1260 in the MEI exposure scenario presents risk that may be on the "borderline" of acceptability. It should be recognized that the MEI, as an upper bound exposure estimate, represents an employee working almost exclusively in "hot spot" regions. Thus, remediation of "hot spots" may be necessary to bring these cancer risks into acceptable ranges for environmental exposures. However, the cancer risks associated with Aroclor 1260 and PAHs present at the site under all three scenarios are not excessive.

For noncarcinogenic compounds, the HI is used to direct attention to compounds for which potential intake approaches a maximum recommended intake (RfD). Since the HI is expressed as a ratio of an estimated intake to a RfD, as the value approaches unity it indicates that potential health impacts could occur if a receptor should be more sensitive than anticipated from the assumptions used in generating the RfD. At the Monsanto Kearny Plant, it was found that for the three exposure scenarios discussed in this risk assessment, the exposure-specific estimated HIs for Aroclor 1248, nonylphenol and dodecylphenol are significantly below unity for baseline conditions. Thus, it can be concluded that there is no evidence to suggest an increased risk of noncarcinogenic effects associated with these chemicals in the soil.

Overall this risk assessment demonstrates that the Monsanto Kearny Plant does not present excessive carcinogenic or noncarcinogenic risk to employees. Future potential uses of the site have been considered in this risk assessment, and both carcinogenic and noncarcinogenic risks estimated under the most likely future use scenario are well within acceptable limits. Although remediation of PCB "hot spots" could lower the projected incremental lifetime cancer risks associated with the MEI, the estimated potential risks, as applied to an occupational setting, do not warrant remediation. Remedial activities for this site are a matter of risk management and this risk assessment provides the necessary input for making these risk management decisions.

9.0 Summary and Remedial Objectives

9.1 Summary of Remedial Investigative Activities

9.1.1 Summary of Site Geology

The Monsanto Kearny Plant lies within the New Jersey Piedmont Lowlands (Newark Basin) Physiographic Province. It is underlain by unconsolidated deposits at depths to 60 to 100 feet below ground surface. The unconsolidated deposits consist of artificial fill, Quaternary Age fluvial mud and silt with inclusions of peat and other organic material, and occasional sand and gravel lenses. These sediments have been deposited on top of Pleistocene Age glacial till consisting of poorly sorted gravels, sand, silts, clay, and glacio-lacustrine clay deposits. Fractured shale bedrock underlies these deposits.

9.1.2 Summary of Site Hydrogeology

Two water-bearing zones occur beneath the site; an upper water-bearing zone within the Recent artificial fill and a lower semi-confined, water-bearing zone. The water table occurs at approximately 2 to 4 feet below the ground surface. Both water-bearing zones flow approximately south-west and discharge to the Passaic River.

9.1.3 Site Investigation

In the initial site investigation five areas of concern were identified as the Acid Sump (AS), Alkylphenol/Sterox Sump (APSS), Secondary Settling Pond (SSP), Tertiary Settling Pond (TSP), and the PCB Disposal Area (PDA). Subsurface samples were taken at 4 to 6 foot and 9 to 11 foot depth intervals to delineate the vertical and horizontal extent of impact. PCBs, BTEX (benzene, toluene, ethylbenzene, xylene), phenol, and metals were commonly identified target compounds at these locations.

The subsurface soil analytical results indicate that compounds of concern are concentrated at the estimated nominal bottom of the sumps and ponds, e.g. 4 to 6 feet below ground

surface. The concentrations of compounds of concern are reduced at the 9 to 11 foot depth interval. The vertical distribution within the PDA is more extensive than at the sumps and ponds (Tables 5.1 to 5.16).

Isoconcentration maps presented in this report, show distributions of BTEX and PCBs at the SSP (Figures 5.10 to 5.13), APSS (Figures 5.14 to 5.17), and PDA (4.4 to 4.11). The AS was eliminated for Phase II sampling due to low concentrations of compounds of concern. At the TSP concentrations of BTEX were greater near the estimated former inlet than at other locations within the TSP. The BTEX and PCB distributions are presented in isoconcentration maps for the AS (Figures 5.13 and 5.19), and TSP (Figures 5.6 to 5.9).

Surface soil samples were collected from the areas of concern and at other process areas and background (perimeter) locations. The surface soil analytical results (Tables 5.16 to 5.22) are similar to the subsurface soil results, with PCBs and other compounds distributed within the APSS, SSP, and PDA, and within the process area. Additionally, concentrations of polycyclic aromatic hydrocarbons (PAHs) exceeded 10 mg/kg in surface soils at two background locations.

Twenty-six ground-water monitoring wells were sampled quarterly and results are presented in Tables 6.4 to 6.16. VOC identifications in both the upper and lower water-bearing zones included acetone, carbondisulfide, chlorobenzene, and BTEX. SVOCs included phenols and base/neutral compounds. PCBs and metals were also identified. Most of the identifications of target compounds were slightly above detection levels, with the exception of chlorobenzene in the lower water-bearing zone. Several non-target compounds were identified in ground-water samples.

On-site air monitoring was conducted for PCBs and total particulates, during subsurface drilling activities, however, there were no detections of either parameter at detection levels ranging between 0.022 $\mu\text{g}/\ell$ and 0.029 $\mu\text{g}/\ell$ for PCBs and 1.3 $\mu\text{g}/\ell$ and 4 $\mu\text{g}/\ell$ for total particulates.

A risk assessment was initiated to evaluate potential risks to human health or the environment for PCBs, carcinogenic PAHs, and two phenolic compounds manufactured on site, which were tentatively identified in soil and ground water (dodecylphenol and nonylphenol). The risk assessment considered potential exposure scenarios for the reasonably exposed individual (REI), and maximum exposed individual (MEI) to consider the potential worker exposure for as long as current on-site activities continue at the plant. A third exposure scenario, the future-use scenario was also included to address possible construction of the site, which may involve a change of site activities. Remedial objectives have been determined for each exposure scenario and are described below.

9.2 Remedial Objectives

The remedial objectives have been established for three exposure scenarios to provide target levels, based on the risk assessment, which protect human health and the environment. This section describes the process to establish remedial objectives for each of the exposure scenarios.

The REI, MEI, and the future-use (construction) scenarios previously described in Section 8.4.1, Section 8.4.2, and Section 8.7, respectively, were used to assist in determining the remedial objectives. Using a target ILCR of $1.0\text{E-}5$ (1.00×10^{-5}) for chemicals identified as possible carcinogens (Aroclor 1260 and benzo(a)pyrene) and a hazard index of $1.00\text{E-}1$ for noncarcinogens (Aroclor 1248, dodecylphenol and nonylphenol) calculations were made for appropriate soil concentrations of the chemicals of potential concern. Tables 9.1 through 9.3 present the estimated target levels of these chemicals of concern in mg/kg based on the REI, MEI, and future-use scenarios, respectively.

Using the assumptions for REI exposure scenario (Section 8.4.1) which describe the most likely level of current activity at the site or normal working conditions, target levels for noncarcinogens are 75,000 mg/kg for Aroclor 1248, 115,000 mg/kg for nonylphenol and 575,000 mg/kg for dodecylphenol. Using this same exposure scenario the target level for compounds identified as carcinogenic are 4,270 mg/kg for Aroclor 1260 and 5,950 mg/kg for

for benzo(a)pyrene. These target levels would be most appropriate for as long as current activities continue at the plant.

The MEI exposure scenario represents an upper bound or worst case exposure estimates that assumes that current operations continue at the site but more vigorous activities (increased exposure) occur than described for the REI. Using the assumptions for the MEI exposure scenario (Section 8.4.2) target levels for the noncarcinogens are 465 mg/kg for Aroclor 1248, 1,690 mg/kg for nonylphenol and 8,450 mg/kg for dodecylphenol. Using this same exposure scenario, the target level for compounds identified as carcinogenic are 26.5 mg/kg for Aroclor 1260 and 130 mg/kg for benzo(a)pyrene. These target levels would also be most appropriate to evaluate upper bound or worst case exposure estimates for as long as current activities continue at the plant.

In addition to considering the continuation of current operations at the site, the site risk assessment also considers the possibility of discontinuing these manufacturing functions and converting the land usage to other industrial activities or warehousing. For that to occur there would be limited construction activities over the short-term (up to 1 year). The future use scenario describes the potential exposure during a construction phase at the site. Using the assumptions for the future use exposure scenario (Section 8.7) target levels for the noncarcinogens are 13,250 mg/kg for Aroclor 1248, 36,800 mg/kg for nonylphenol and 184,000 mg/kg for dodecylphenol. Using this same exposure scenario the target level for compounds identified as carcinogenic are 755 mg/kg for Aroclor 1260 and 699 mg/kg for benzo(a)pyrene. Use of these target levels would be most appropriate if the current manufacturing activities ceased and construction of new manufacturing and/or warehousing was to occur.

Respectfully Submitted,
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Table 3.1 Products Manufacturing History. Monsanto Kearny Plant. Kearny, New Jersey.

| Year | Activity |
|------|---------------------------------------------------------------------------------------------------|
| 1955 | Production of phosphoric acid and sodium tripolyphosphate (STP) begins. |
| 1956 | Production of Steroxes begins. |
| 1960 | Production of Alkylphenols begins. |
| 1966 | Second units of phosphoric acid and STP begin production. |
| 1983 | Older STP unit terminates production. |
| 1985 | All phosphates manufacturing terminates (i.e. phosphoric acid and STP), and units are dismantled. |
| 1990 | Sterox Production terminates. |

Table 4.1. Summary of Analytical Results of PCBs (Aroclor 1248) for Storch Engineers Soil Boring Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring Identification ¹ | Depth of Sampling Interval (In Feet BGS) | | | | | | | |
|------------------------------------|------------------------------------------|--------------------|---------|--------|-------|-------|-------|--------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 |
| B-1 | 21,300 | 23,800 | 38,100 | 5,660 | N/A | N/A | N/A | N/A |
| B-2A | 7,800 | 10,200 | 507,000 | 1,320 | N/A | N/A | N/A | N/A |
| B-3 | 4,600 | 4,020 | 5,820 | 1,610 | N/A | N/A | N/A | N/A |
| B-4A | 1,520 ² | 1,520 ² | NR | 4,450 | N/A | N/A | N/A | N/A |
| B-5 | 11,000 | 3,750 | 436,000 | 82,000 | N/A | N/A | N/A | N/A |
| B-6 | 36,000 | 548 | 412 | 682 | N/A | N/A | N/A | N/A |
| B-7 | 28,800 | 64,500 | 416 | <5 | N/A | N/A | N/A | N/A |
| B-8 | 8,980 | 26,400 | 6,160 | 33 | N/A | N/A | N/A | N/A |
| B-9 | 2,620 | 515 | 710 | 213 | N/A | N/A | N/A | N/A |
| B-10 | 32 | 27 | <5 | 5 | N/A | N/A | N/A | N/A |
| B-11 | 199 | 129 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-12 | 73 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-13 | 14 | 41 | 23 | 6 | N/A | N/A | N/A | N/A |
| B-14 | 1,970 | 164 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-15 | 14 | 7 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-16 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-17 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-18 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-19 | <5 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-20 | 53 | 36 | 17 | <5 | N/A | N/A | N/A | N/A |
| B-21 | 16 | 29 | 27 | <5 | N/A | N/A | N/A | N/A |
| B-22 | <5 | 10 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-23 | 6 | <5 | <5 | <5 | N/A | N/A | N/A | N/A |
| B-24 | 21,500 | 19,500 | 195,000 | 960 | 97 | 130 | N/A | N/A |
| B-25 | 2,700 | NR | 98,500 | 29,500 | 3,100 | 63 | 1,400 | 16,500 |
| B-26 | 30,000 | 53,000 | 185,000 | 680 | 5,400 | 123 | 250 | 50 |
| B-27 | 8,500 | 51,000 | 53,000 | 32 | 960 | 100 | 910 | 260 |
| B-28 | 77 | NR | 10 | <5 | 6.2 | <5 | 33 | 43 |
| B-29 | <5 | 12 | 29 | 13 | N/A | N/A | N/A | N/A |

Results are reported in milligrams per kilogram (mg/kg).

Detection limit = 5 ppm

NR = No sample recovered during boring.

¹Borings B-1 to B23 and B-29 advanced to only 8 feet below ground surface.

²Composite sample due to low recovery.

N/A = Not analyzed.

Samples were collected between September 1983 and February 1984.

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Table 4.2 Summary of Analytical Results of PCBs (Aroclor 1248) for OHM Phase I Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring Identification | Depth of Sampling Interval (In Feet BGS) | | | | | | | | | | | | | |
|-----------------------|------------------------------------------|---------|--------|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 |
| S-1 | BDL | BDL | N/A | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-2 | 1 | BDL | N/A | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-3 | BDL | 146 | 23 | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-4 | 2 | 1 | 227 | 818 | 1 | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-5 | 4 | 2 | 31 | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-6 | 644 | 467 | 10,500 | 12 | 18 | 1 | 11 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-7 | BDL | BDL | N/A | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S-8 | BDL | 3 | BDL | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| D-1 | BDL | 1 | BDL | BDL | N/A | N/A | N/A | 3 | N/A | N/A | N/A | N/A | N/A | N/A |
| D-2 | BDL | BDL | N/A | N/A | N/A | N/A | N/A | BDL | N/A | N/A | N/A | N/A | N/A | N/A |
| 3-D | BDL | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 9-D* | 22,900 | 123,000 | 5,960 | 499 | 92 | 76 | 153 | 1 | BDL | BDL | 10 | 20 | 2 | 6 |
| 10-D | 1 | 6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 11-D | BDL | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 12-D | BDL | N/A | BDL | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

Results reported in milligrams per kilogram (mg/kg).

Detection Limit = 1.0 ppm.

BDL = Below detection limit.

* Only samples from boring 9-D were analyzed at each interval to depth.

Samples were collected in September 1984.

N/A = Not analyzed.

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Table 4.3. Summary of Analytical Results of PCBs (Aroclor 1248) for OHM Phase II Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Boring
Identification | Depth of Sampling Interval (In Feet) | | | | |
|--------------------------|--------------------------------------|-----|-----|-----|------|
| | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 |
| A | 6 | 84 | 46 | 1 | 7 |
| B | 49 | 19 | BDL | N/A | N/A |
| C | 144 | 22 | 14 | 21 | BDL |
| D | 2 | 8 | 4 | BDL | N/A |
| E | 1 | 7 | 1 | BDL | N/A |
| F | 3 | 22 | 9 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

Detection Limit = 1.0 ppm.

BDL = Below detection limit.

N/A = Not sampled.

Samples were collected in November and December 1989.

**Table 4.4. Summary of Analytical Results for Aqueous Samples for OHM Phase I Test Pits.
Monsanto Kearny Plant. Kearny, New Jersey.**

| | Test Pit Identification | | | |
|------------------------------------------------------|-------------------------|------|---------------------|------|
| | TP9 | TP10 | TP11 ^{4,5} | TP12 |
| Volatile Organic Compounds (VOCs)¹ | | | | |
| Trichloroethane | BDL | BDL | 29,000 | BDL |
| Toluene | BDL | BDL | 234,000 | BDL |
| Bis-(1,1-Dimethylethyl)-
Diazene | BDL | BDL | 80,000 | BDL |
| 2,3-Dimethylhexane | BDL | BDL | 6,000 | BDL |
| 3,3-Dimethylehexanol | BDL | BDL | 26,000 | BDL |
| 2,2,4-Trimethylhexane | BDL | BDL | 17,000 | BDL |
| 2,3-Dimethylheptane | BDL | BDL | 3,000 | BDL |
| Methylcyclopentane | BDL | BDL | 230,000 | BDL |
| 3-Ethyl-3-Methylhexane | BDL | BDL | 324,000 | BDL |
| Xylenes | BDL | BDL | 68,000 | BDL |
| Priority Pollutant Metals² | | | | |
| Arsenic | BDL | BDL | BDL | 0.05 |
| Copper | BDL | 0.35 | BDL | BDL |
| Selenium | 0.01 | BDL | BDL | BDL |
| Zinc | 0.60 | 0.72 | 0.31 | 0.40 |
| PCB (Aroclor 1248) ³ | 0.124 | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Detection limit is 0.01 ppm.

²Detection limits for Arsenic = 0.01 ppm; Copper = 0.2 ppm; Selenium = 0.01 ppm; and Zinc = 0.2 ppm.

³Detection limit = 1 ppb.

⁴Aqueous sample for TP11 included separate, free-phase, floating product.

⁵Detection limit for VOCs and PCBs in sample TP11 is 10 ppm.

Samples were collected in October 1984.

Table 4.5. Summary of Analytical Results for OHM Ground-Water Samples. October 1984. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|------------------------------------------|-----------------------|-----|-----|-----|-----|-----|-----|-------|-----|-----|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 295 | 17 | BDL |
| Bromomethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 180 | BDL | BDL |
| Bromoform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 108 | BDL | BDL |
| Carbon Tetrachloride | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 125 | BDL | BDL |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 248 | 91 | BDL |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 178 | BDL | BDL |
| Dibromochloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 190 | BDL | BDL |
| 1,1-Dichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 72 | BDL | BDL |
| 1,2-Dichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 51 | BDL | BDL |
| 1,2-Dichloropropane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 246 | BDL | BDL |
| Trans,-1,3-Dichloropropene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 213 | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 285 | BDL | BDL |
| Methylene Chloride | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 362 | BDL | BDL |
| 1,1,2,2-Tetrachloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 194 | BDL | BDL |
| Tetrachloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 220 | BDL | BDL |
| 1,1,1-Trichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 132 | BDL | BDL |
| 1,1,2-Trichloroethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 202 | BDL | BDL |
| Trichloroethene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 389 | BDL | BDL |
| Toluene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 339 | BDL | BDL |
| Total VOCs | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 4,029 | 108 | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

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Table 4.5. Summary of Analytical Results for OHM Ground-Water Samples. October 1984. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Accenaphthene | BDL | BDL | 22 | BDL | 12 | BDL | BDL | BDL | 16 | BDL |
| Bis(2-ethylhexyl)-phthaate | 20 | 11 | 20 | 22 | 21 | 32 | 12 | 19 | 33 | 21 |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 17 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 104 | BDL |
| Fluoranthene | BDL | 21 | BDL | BDL | 18 | BDL | BDL | BDL | BDL | BDL |
| Flourene | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Naphthalene | BDL | BDL | 20 | BDL | 65 | 186 | BDL | BDL | 28 | BDL |
| N-Nitrosodiphenylamine | BDL | BDL | 19 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Phenanthrene | BDL | 20 | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | 20 | BDL | BDL | 14 | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 20 | 72 | 91 | 22 | 140 | 218 | 12 | 19 | 198 | 21 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| 2,4-Dimethylphenol | BDL | BDL | BDL | BDL | BDL | 34 | BDL | BDL | BDL | BDL |
| Phenol | BDL | BDL | BDL | BDL | 261 | BDL | BDL | BDL | BDL | BDL |
| Total AEs | BDL | BDL | BDL | BDL | 261 | 34 | BDL | BDL | BDL | BDL |
| PCB (Aroclor 1248) | BDL | 22.6 | BDL | BDL | 1.2 | BDL | 5.7 | 1.6 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).
BDL = Below detection limit.

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Table 4.6. Summary of Analytical Results for Monsanto Ground-Water Samples. March 1985. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | | |
|--------------------------------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------------------|----------------------|-------------|
| | Well 1S | Well 2S | Well 3S | Well 4S | Well 5S | Well 6S | Well 7S | Well 8S | Well 9 ¹ | Well 10 ² | Field Blank |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | |
| Bromodichloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 10 | BDL |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 34 | 80 | BDL |
| Methylene Chloride | BDL | 7 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | BDL | 7 | BDL | BDL | BDL | BDL | BDL | BDL | 34 | 90 | BDL |
| Base/Neutral Extractable Semi-Volatile Compounds (BNs) | | | | | | | | | | | |
| Acenaphthene | BDL | BDL | BDL | BDL | BDL | 15 | BDL | BDL | BDL | BDL | BDL |
| Benzo (A) Anthracene | BDL | BDL | BDL | BDL | BDL | 29 | BDL | BDL | BDL | BDL | BDL |
| Benzo (K) Fluoranthene | 10 | BDL | BDL | BDL | BDL | 18 | BDL | BDL | BDL | BDL | BDL |
| Benzo (A) Pyrene | BDL | BDL | BDL | BDL | BDL | 10 | BDL | BDL | BDL | BDL | BDL |
| Fluoranthene | BDL | BDL | BDL | BDL | BDL | 28 | BDL | BDL | BDL | BDL | BDL |
| Fluorene | BDL | BDL | BDL | BDL | BDL | 19 | BDL | BDL | BDL | BDL | BDL |
| Naphthalene | BDL | BDL | BDL | BDL | BDL | 128 | BDL | BDL | BDL | BDL | BDL |
| Phenanthrene | BDL | BDL | BDL | BDL | BDL | 33 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | BDL | BDL | BDL | BDL | 13 | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 10 | BDL | BDL | BDL | BDL | 293 | BDL | BDL | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | | |
| Arsenic | BDL | BDL | BDL | BDL | BDL | BDL | 20 | BDL | BDL | BDL | 7 |
| Cadmium | 20 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Chromium | 14 | 50 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Copper | 10 | BDL | 40 | BDL | BDL | BDL | BDL | BDL | 240 | BDL | BDL |
| Lead | 50 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 120 | BDL | BDL |
| Zinc | 20 | BDL | 130 | 20 | 100 | BDL | BDL | BDL | 340 | 70 | 140 |
| Total Phenols | 190 | 20 | 20 | 140 | 130 | 100 | 20 | 120 | 50 | 20 | 350 |
| Total PCBs ³ | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Discharge to POTW.

²Kearny City Water.

³Detection limit was 50 ppb.

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Table 4.7. Summary of Analytical Results for Monsanto Ground-Water Samples. October 1985. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|---------------------------------------------------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------------------|----------------------|
| | Well 1S | Well 2S | Well 3S | Well 4S | Well 5S | Well 6S | Well 7S | Well 8S | Well 9 ¹ | Well 10 ² |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | 1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Bromodichloromethane | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 10 |
| Chloroform | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2 | 35 | 46 |
| Methylene Chloride | BDL | BDL | BDL | BDL | 280 | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | BDL | 1 | BDL | BDL | 280 | BDL | BDL | 2 | 35 | 56 |
| Base/Neutral Extractable Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | BDL | BDL | BDL | BDL | BDL | BDL | 12 | BDL | BDL | BDL |
| Fluoranthene | BDL | BDL | BDL | BDL | BDL | BDL | 13 | BDL | BDL | BDL |
| Total BNs | BDL | BDL | BDL | BDL | BDL | BDL | 25 | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | |
| Antimony | 67 | BDL | 16 | 19 | 65 | 130 | BDL | 70 | BDL | BDL |
| Arsenic | BDL | BDL | BDL | BDL | 80 | 11 | 58 | BDL | BDL | BDL |
| Chromium | 80 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 80 | BDL |
| Copper | 30 | BDL | 90 | 20 | 100 | BDL | BDL | 30 | 60 | 60 |
| Lead | 100 | BDL | BDL | 150 | 150 | 60 | BDL | BDL | 100 | BDL |
| Mercury | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2 | BDL | BDL |
| Nickel | 120 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Selenium | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 30 | BDL | BDL |
| Zinc | 90 | 260 | 470 | 70 | 290 | 320 | BDL | BDL | 480 | 360 |
| Total PCBs³ | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Discharge to POTW.

²Kearny City Water.

³Detection limit was 50 ppb.

Table 4.8. Summary of Analytical Results for OHM Ground-Water Samples. August, 1986. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|------------------------|------------------------|------------------------|--------------|-------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | 3S | 9S | 10S | 11S | 12S | 3D | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | 13.5 | 13.6 | 8.1 | BDL | BDL | 13.2 | 33.5 |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | 247 | BDL | 688 | 61.7 | 9.6 |
| Chloroform | 3.6 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | 39.5 | BDL | BDL | BDL | BDL | 15.5 | BDL |
| Methylene Chloride | BDL | 6.0 | 9.7 | 19.9 | 9.3 | 7.5 | 5.9 | 6.1 | 13.2 | BDL |
| 1,1,1-Trichloroethane | BDL | 4.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Toluene | BDL | BDL | BDL | 59.5 | BDL | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | 3.6 | 10.8 | 9.7 | 132.4 | 22.9 | 262.6 | 5.9 | 674.1 | 103.6 | 43.1 |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | BDL | 5.5 | 25.4 | 9.1 | 16.0 | 3.6 | 7.3 | 8.4 | 6.0 | 5.1 |
| Anthracene | BDL | BDL | BDL | BDL | 3.4 | BDL | BDL | BDL | BDL | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 21.2 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 7.1 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 28.7 | 48.3 | BDL |
| Fluoranthene | BDL | 3.6 | 9.6 | BDL | 9.4 | BDL | BDL | BDL | BDL | BDL |
| Flourene | BDL | 2.9 | 7.5 | 4.2 | 5.3 | BDL | BDL | 2.9 | BDL | BDL |
| Naphthalene | BDL | BDL | 4.6 | 4.6 | 22.4 | 60.8 | BDL | BDL | 9.1 | BDL |
| Phenanthrene | BDL | 5.9 | BDL | BDL | 10.3 | BDL | BDL | BDL | BDL | BDL |
| Pyrene | BDL | 3.4 | 7.7 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Total BNs | BDL | 21.3 | 54.8 | 17.9 | 66.8 | 64.4 | 7.3 | 61.2 | 70.5 | 5.1 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| 2-Chlorophenol | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 13.0 | BDL | BDL |
| 2,4-Dimethylphenol | BDL | BDL | BDL | 3.4 | BDL | 9.0 | BDL | BDL | 11.9 | BDL |
| Phenol | BDL | BDL | BDL | 8.0 | BDL | BDL | BDL | BDL | BDL | 4.9 |
| Total AEs | BDL | BDL | BDL | 11.4 | BDL | 9.0 | BDL | 13.0 | 11.9 | 4.9 |
| PCB (Aroclor 1248) | BDL¹ | BDL² | BDL¹ | BDL | BDL | BDL¹ | BDL¹ | BDL¹ | BDL¹ | BDL¹ |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below minimum detection limit.

¹Detection limit varied up to 35 ppb.

²Aroclor 1260 detected at 2.8 ppb.

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Table 4.9. Summary of Analytical Results for OHM Ground-Water Samples. April 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|
| | 3S | 8S | 9S | 10S | 11S | 12S | 9D | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | |
| Benzene | BDL | BDL | BDL | 9.2 | 14.6 | BDL | BDL | BDL | 20.3 | BDL |
| Chlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 4,270 | 109 | 12.9 |
| Chloroform | BDL | BDL | 1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Ethylbenzene | BDL | BDL | BDL | BDL | 11.9 | BDL | BDL | BDL | BDL | BDL |
| Methylene Chloride | 8.9 | 3.2 | 4.3 | 6.5 | 11.7 | 355 | 3.4 | BDL | 12.2 | 7.5 |
| Toluene | BDL | BDL | BDL | BDL | 26.6 | BDL | BDL | BDL | BDL | BDL |
| Total VOCs | 8.9 | 3.2 | 5.3 | 15.5 | 65.5 | 355 | 3.4 | 4,270 | 141.5 | 20.5 |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | |
| Acenaphthene | 7 | 2.3 | 4.1 | 38.5 | 11.1 | 9 | 3.5 | 9.9 | 10.7 | 7.3 |
| Anthracene | BDL | BDL | 2.9 | 2.8 | BDL | 2.3 | BDL | BDL | BDL | BDL |
| Bis(2-ethylhexyl)-phthalate | BDL | BDL | BDL | BDL | BDL | BDL | 19.2 | BDL | BDL | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 81.1 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 7.6 | 16.9 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 133 | 101 | BDL |
| Fluoranthene | BDL | BDL | 3.3 | 5 | BDL | 2.5 | BDL | BDL | BDL | BDL |
| Flourene | BDL | BDL | 2.5 | 17.5 | 5.2 | 3.3 | BDL | 3.9 | BDL | BDL |
| Naphthalene | 8.3 | BDL | BDL | 15.4 | 4.4 | 9.7 | BDL | 13.2 | 4.2 | BDL |
| Phenanthrene | BDL | BDL | 7.6 | 13.1 | 5.8 | 7.4 | BDL | BDL | BDL | BDL |
| Pyrene | BDL | BDL | 2.9 | 4 | BDL | BDL | BDL | BDL | BDL | BDL |
| Total BNs | 15.3 | 2.3 | 23.4 | 96.3 | 26.4 | 34.5 | 22.7 | 258.2 | 115.9 | 7.3 |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | |
| Phenol | BDL | BDL | 8.8 | BDL | 2.7 | BDL | 2.1 | 1.9 | BDL | BDL |
| Total AEs | BDL | BDL | 8.8 | BDL | 2.7 | BDL | 2.1 | 1.9 | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Aroclor 1242 detected at 1.35 ppb.²Aroclor 1232, Aroclor 1221, and Aroclor 1016 (all detected at 6.2 ppb).

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Table 4.9. Summary of Analytical Results for OHM Ground-Water Samples. April 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | |
|----------------------------------|-----------------------|-----|-----|-----|------------------|-----|------------------|-----|-----|-----|
| | 3S | 8S | 9S | 10S | 11S | 12S | 9D | 10D | 11D | 12D |
| PCB (Aroclor 1248) | BDL | BDL | 131 | BDL | BDL ¹ | BDL | 6.2 ² | BDL | BDL | BDL |
| Priority Pollutant Metals | | | | | | | | | | |
| Antimony | 38 | 63 | BDL | 25 | BDL | BDL | BDL | 170 | BDL | BDL |
| Arsenic | 78 | 76 | 110 | 43 | BDL | BDL | BDL | 4 | BDL | BDL |
| Beryllium | BDL | BDL | 2.8 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Cadmium | BDL | BDL | 4.1 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Chromium | BDL | BDL | 200 | BDL | BDL | BDL | BDL | BDL | BDL | 22 |
| Copper | BDL | BDL | 340 | BDL | 12 | 14 | 24 | 20 | 14 | 30 |
| Lead | BDL | BDL | 800 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Mercury | BDL | BDL | 1.9 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Nickel | 20 | BDL | 160 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| Selenium | BDL | BDL | BDL | 1 | BDL | BDL | BDL | 1 | BDL | BDL |
| Silver | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 20 | BDL | BDL |
| Thallium | 150 | 140 | BDL | BDL | BDL | BDL | BDL | 300 | BDL | BDL |
| Zinc | 30 | 40 | 820 | BDL | 20 | BDL | BDL | BDL | BDL | 50 |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

¹Aroclor 1242 detected at 1.35 ppb.

²Aroclor 1232, Aroclor 1221, and Aroclor 1016 (all detected at 6.2 ppb).

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Table 4.10. Summary of Analytical Results for OHM Ground-Water Samples. December 1987. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification | | | | | | | | | | | |
|----------------------------------------------------------------|-----------------------|------------------|----------------|------------------|-------------|-------------|-------------|-----------------|-----------------|-------------|--------------|------------|
| | 1S | 5S | 9S | 9S* | 10S | 11S | 12S | 9D | 9D* | 10D | 11D | 12D |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | | |
| Benzene | BDL | 4.9 | BDL | NA | BDL | BDL | BDL | 4.7 | NA | BDL | 14.7 | BDL |
| Chlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 218 | 89.9 | BDL |
| Methylene Chloride | 25.2 | BDL | BDL | NA | BDL | 90.9 | BDL | BDL | NA | BDL | BDL | BDL |
| Total VOCs | 25.2 | 4.9 | BDL | NA | BDL | 90.9 | BDL | 4.7 | NA | 218 | 104.6 | BDL |
| Base/Neutral Extractables Semi-Volatile Compounds (BNs) | | | | | | | | | | | | |
| Acenaphthene | 2.6 | 7.7 | 7.1 | NA | 26.7 | 8.8 | 6.6 | 22.9 | NA | 8.9 | 11 | BDL |
| Anthracene | BDL | BDL | BDL | NA | 3.1 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Bis(2-ethylhexyl)-phthalate | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | 17.9 | BDL |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 12.3 | BDL | BDL |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | 12.5 | BDL |
| 1,4-Dichlorobenzene | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 29.7 | 77.4 | BDL |
| Fluoranthene | BDL | 2.4 | 3.7 | NA | 9 | BDL | 4 | BDL | NA | BDL | BDL | BDL |
| Fluorene | BDL | BDL | BDL | NA | 13.2 | 5.6 | 2.7 | 4.9 | NA | 2.7 | BDL | BDL |
| Naphthalene | BDL | BDL | BDL | NA | 21.3 | 7.8 | 7.4 | BDL | NA | 1.9 | 4.3 | BDL |
| Phenanthrene | BDL | BDL | BDL | NA | 18.7 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Pyrene | BDL | BDL | BDL | NA | 7.2 | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Total BNs | 2.6 | 10.1 | 10.8 | NA | 99.2 | 22.2 | 20.7 | 27.8 | NA | 55.5 | 123.1 | BDL |
| Acid Extractable Semi-Volatile Compounds (AEs) | | | | | | | | | | | | |
| 2-Chlorophenol | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 3.3 | BDL | BDL |
| Phenol | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | BDL | BDL | BDL |
| Total AEs | BDL | BDL | BDL | NA | BDL | BDL | BDL | BDL | NA | 3.3 | BDL | BDL |
| PCB ¹ | BDL | 1.5 ² | 6 ³ | 6.2 ³ | BDL | BDL | BDL | 20 ² | 21 ² | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

BDL = Below detection limit.

NA = Not Analyzed.

¹Detection Limit Fluctuated from 1.3 to 0.50 ppb.

²Aroclor 1248

³Aroclor 1016.

⁴Aroclor 1254 and Aroclor 1260.

* Filtered sample only analyzed for PCBs.

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Table 4.11. Summary of Analytical Results of PCBs (Aroclor 1248) for Ground-Water Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| Sample Identification | October 1984 | August 1986 ¹ | April 1987 | December 1987 | April 1988 |
|-----------------------|--------------|--------------------------|-------------------|---------------|------------|
| 3S | BDL | BDL | BDL | NA | NA |
| 3D | BDL | BDL | NA | NA | NA |
| 5S | NA | NA | NA | 1.5 | NA |
| 8S | NA | NA | BDL | NA | NA |
| 9S | 22.6 | 2.8 ² | 131 | 6.0 | 99.3 |
| 9D | 5.7 | BDL | 6.2 ³ | 20.0 | 24.2 |
| 10S | BDL | BDL | BDL | BDL | BDL |
| 10D | 1.6 | BDL | BDL | BDL | BDL |
| 11S | BDL | BDL | 1.35 ⁴ | BDL | BDL |
| 11D | BDL | BDL | BDL | BDL | BDL |
| 12S | 1.2 | BDL | BDL | BDL | BDL |
| 12D | BDL | BDL | BDL | BDL | BDL |

Results are reported in milligram per kilogram (mg/kg).

Detection Limit = 1 ppb, unless noted.

BDL = None detected.

NA = Not analyzed.

¹Detection Limit varied up to 35 ppb.

²Aroclor 1260.

³Aroclor 1232, Aroclor 1221, and Aroclor 1016 detected at 6.2 ppb.

⁴Aroclor 1242.

Table 5.1. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | |
|--------------|-----------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | TSP ⁽²⁾
1 | TSP ⁽²⁾
2 | TSP ⁽²⁾
3 | TSP ⁽²⁾
4 | TSP ⁽³⁾
5 |
| | <u>Volatile TCLs</u> | | | | | |
| 4 to 6 feet | Toluene (0.006) | ND | ND | ND | ND | 18 |
| | Ethylbenzene (0.05) | ND | ND | ND | ND | 6.2 |
| | total Xylenes (<0.67) | ND | ND | ND | ND | 1 |
| | Total Volatile TCLs | ND | ND | ND | ND | 25.2 |
| | <u>Volatile TCLs</u> | | | | | |
| 9 to 11 feet | Toluene (<0.67) | N/A | N/A | N/A | N/A | ND |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | N/A | 2 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | N/A | 0.5 J |
| | Total Volatile TCLs | N/A | N/A | N/A | N/A | 2.5 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

The analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

⁽²⁾Samples TSP-1, TSP-2, TSP-3 and TSP-4 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Sample TSP-5 was collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, xylenes (BTEX) only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table 5.2. Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | |
|--------------|-------------------|-----------------------------------|----------|----------|----------|
| | | TSP
1 | TSP
2 | TSP
3 | TSP
4 |
| 4 to 6 feet | Semivolatile TCLs | ND | ND | ND | ND |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles.

There was no request for semivolatile analysis in the April 1991 sampling.

Table 5.3. Summary of Analytical Results of PCBs for Soil Boring Samples Collected at the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | |
|--------------|--------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | TSP ⁽²⁾
1 | TSP ⁽²⁾
2 | TSP ⁽²⁾
3 | TSP ⁽²⁾
4 | TSP ⁽³⁾
5 |
| | <u>PCBs</u> | | | | | |
| 4 to 6 feet | Aroclor 1248 | 6 J | 0.8 J | 3 J | 1 J | 1.3 J |
| | Aroclor 1260 | 5 J | 0.4 J | 1 J | 2.5 J | 1.4 |
| | Total PCBs | 11 J | 1.1 J | 4 J | 3.5 J | 2.7 |
| | <u>PCBs</u> | | | | | |
| 9 to 11 feet | Aroclor 1248 | N/A | N/A | N/A | N/A | 1.2 J |
| | Aroclor 1260 | N/A | N/A | N/A | N/A | 0.9 J |
| | Total PCBs | N/A | N/A | N/A | N/A | 2.1 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels range between 0.5 and 11 mg/kg for Aroclor 1248 and 0.9 and 22 mg/kg for Aroclor 1260.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

⁽²⁾Samples TSP-1, TSP-2, and TSP-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples TSP-4, TSP-5, and TSP-6 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table 5.4. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Tertiary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | | |
|--------------|----------------------|-----------------------------------|--------|--------|--------|
| | | TSP 1 | TSP 2 | TSP 3 | TSP 4 |
| 4 to 6 feet | Aluminum (29.8) | 2440 | 7790 | 3480 | 3150 |
| | Antimony (45.4) | 12.6 J | 14.1 J | 10.7 J | 10.6 J |
| | Arsenic (47.9) | 43.5 | 53.4 | 2.9 | 1.4 B |
| | Barium (0.7) | 17.5 B | 108 | 15.2 B | 12.3 B |
| | Beryllium (0.3) | 0.2 B | 0.5 B | 0.1 B | 0.1 J |
| | Cadmium (4.5) | 1.2 J | 2.9 J | 1.1 J | 1.1 J |
| | Calcium (25.8) | 2140 | 11700 | 890 B | 673 B |
| | Chromium (3.7) | 87.2 | 111 | 19.9 | 8.5 |
| | Cobalt (5.1) | 1.6 B | 7.1 B | 1.6 B | 1.6 B |
| | Copper (2.3) | 39.7 | 140 | 10.4 | 8.1 |
| | Iron (13.5) | 7100 | 24400 | 8530 | 6780 |
| | Lead (48.1) | 84.3 | 137 | 13.9 J | 11.2 J |
| | Magnesium (96.3) | 913 B | 5070 | 1460 | 1410 |
| | Manganese (0.8) | 74.0 | 621 | 334 | 65.9 |
| | Mercury (0.2) | 0.5 | 0.9 | 0.1 J | 0.1 J |
| | Nickel (24.2) | 11.5 | 37.9 | 9.4B | 10.5 |
| | Potassium (2048) | 1140 B | 2050 | 482 J | 479 J |
| | Selenium (74.4) | 0.7 B | 1.2 B | 0.5 J | 0.5 J |
| | Silver (3.2) | 0.9 J | 1.1 B | 0.8 J | 0.8 J |
| | Sodium (1814) | 503 J | 565 J | 427 J | 424 J |
| | Thallium (218) | 0.6 J | 0.6 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 15.4 | 107 | 14.2 | 10.4B |
| | Zinc (3.3) | 173 | 233 | 36 | 21 |
| | Cyanide, total (0.5) | ND | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each parameter.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. TSP 1 @ 4 to 6 feet is sample TSP-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 and 6 feet below ground surface on May 8, 1990.

Samples which were collected on April 4 were not analyzed for inorganic parameters.

Table 5.5. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | | |
|--------------|----------------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | SSP ⁽²⁾
1 | SSP ⁽²⁾
2 | SSP ⁽²⁾
3 | SSP ⁽³⁾
4 | SSP ⁽³⁾
5 | SSP ⁽³⁾
6 | SSP ⁽³⁾
7 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | | | | | |
| | Benzene (<0.67) | ND | ND | ND | ND | ND | 0.3 | N/A |
| | Toluene (0.006) | 58 | ND | ND | ND | 0.4 | 0.8 | N/A |
| | Ethylbenzene (0.005) | 2.3 J | ND | ND | 3.1 | 0.8 | 3.2 | N/A |
| | total Xylenes (<0.67) | ND | ND | ND | 0.8 | 0.2 | 2.2 | N/A |
| | Total Volatile TCLs | 60.3 | ND | ND | 3.9 | 1.4 | 6.5 | N/A |
| 9 to 11 feet | <u>Volatile TCLs</u> | | | | | | | |
| | Benzene (<0.67) | N/A | N/A | N/A | ND | 0.3 J | 0.2 J | 0.2 J |
| | Toluene (<0.67) | N/A | N/A | N/A | ND | ND | 0.4 J | 3.8 |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | ND | 1.8 | 2.7 | 0.8 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | 0.8 | 2.1 | 0.9 | 0.6 |
| | Total Volatile TCLs | N/A | N/A | N/A | 0.8 | 4.2 | 4.2 | 5.4 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

⁽²⁾Samples SSP-1, SSP-2, and SSP-3 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Samples SSP-4, SSP-5, SSP-6 and SSP-7 were collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, and total xylenes (BTEX), only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table 5.6. Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | |
|--------------------------|----------|-----------------------------------|----------|----------|
| | | SSP
1 | SSP
2 | SSP
3 |
| <u>Semivolatile TCLs</u> | | | | |
| 4 to 6 feet | Phenol | ND | 140 | 110 J |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles.

There was no request for semivolatile analysis in the April 1991 sampling.

Table 5.7. Summary of Analytical Results of PCBs for Soil Boring Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | | |
|--------------|--------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | SSP ⁽²⁾
1 | SSP ⁽²⁾
2 | SSP ⁽²⁾
3 | SSP ⁽³⁾
4 | SSP ⁽³⁾
5 | SSP ⁽³⁾
6 | SSP ⁽³⁾
7 |
| 4 to 6 feet | <u>PCBs</u> | | | | | | | |
| | Aroclor 1248 | 280 | 25 | 29 | 3.3 | ND | 41 | N/A |
| | Aroclor 1260 | 43 | 23 | 49 | 17 | 200 | 14 J | N/A |
| | Total PCBs | 323 | 48 | 78 | 20.3 | 200 | 55 | N/A |
| 9 to 11 feet | <u>PCBs</u> | | | | | | | |
| | Aroclor 1248 | N/A | N/A | N/A | 0.6 J | 5.9 | 0.2 | 1.5 |
| | Aroclor 1260 | N/A | N/A | N/A | 6.7 | 75 | 0.5 | 5.3 |
| | Total PCBs | N/A | N/A | N/A | 7.3 | 80.9 | 0.7 | 6.8 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels range between 2 and 12 mg/kg for Aroclor 1248 and 20 to 24 mg/kg for Aroclor 1260.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

⁽²⁾Samples SSP-1, SSP-2, and SSP-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples SSP-4, SSP-5, SSP-6 and SSP-7 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table 5.8. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Secondary Settling Pond. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | |
|--------------|----------------------|-----------------------------------|----------|----------|
| | | SSP
1 | SSP
2 | SSP
3 |
| 4 to 6 feet | Aluminum (29.8) | 3320 | 6310 | 13900 |
| | Antimony (45.4) | 11.2 J | 13.2 J | 13.6 J |
| | Arsenic (47.9) | 4.7 | 18.6 | 12.7 |
| | Barium (0.7) | 27.9 B | 70.4 | 137 |
| | Beryllium (0.3) | 0.2 B | 1.1 B | 2.5 |
| | Cadmium (4.5) | 1.1 J | 1.3 J | 1.3 J |
| | Calcium (25.8) | 26500 | 2120 | 28300 |
| | Chromium (3.7) | 108 | 28.4 | 21.5 |
| | Cobalt (5.1) | 2.7 B | 8.2 B | 7.9 |
| | Copper (2.3) | 32.8 | 67.2 | 91.4 |
| | Iron (13.5) | 8790 | 16300 | 25400 |
| | Lead (48.1) | 43.3 | 50.9 | 149 |
| | Magnesium (96.3) | 1800 | 954 B | 815 B |
| | Manganese (0.8) | 92.8 | 82 | 320 |
| | Mercury (0.2) | 0.4 | 0.3 | 0.2 |
| | Nickel (24.2) | 8.6 B | 25.4 | 28.1 |
| | Potassium (2048) | 504 J | 594 J | 1010 B |
| | Selenium (74.4) | 0.5 B | 1.7 | 1.4 B |
| | Silver (3.2) | 0.8 J | 1.0 J | 1.0 J |
| | Sodium (1814) | 447 J | 526 J | 542 J |
| | Thallium (218) | 0.5 J | 0.8 B | 0.6 J |
| | Vanadium (3.9) | 15.4 | 23.9 | 35 |
| | Zinc (3.3) | 337 | 160 | 55.9 |
| | Cyanide, total (0.5) | 2.0 | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each compound.

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 to 6 feet below ground surface on May 8, 1990.

Samples which were collected on April 4 were not analyzed for inorganic parameters.

⁽¹⁾ Sample identification is a combination of sample boring locations and depth intervals (e.g. SSP 1 @ 4 to 6 feet is sample SSP-146).

Table 5.9. Summary of Analytical Results of Volatile Organic Compounds for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | | | | |
|--------------|-----------------------------|-----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | APS ⁽²⁾
1 | APS ⁽²⁾
2 | APS ⁽²⁾
3 | APS ⁽³⁾
4 | APS ⁽³⁾
5 | APS ⁽³⁾
6 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | | | | |
| | Toluene (<0.67) | 2.5 | ND | ND | 17 | 2 | N/A |
| | Ethylbenzene (0.005) | ND | ND | ND | 2.8 | 1.7 | N/A |
| | total Xylenes (<0.67) | ND | ND | ND | 1.9 | 0.5J | N/A |
| | Total Volatile TCLs | 2.5 | ND | ND | 21.7 | 4.2 | N/A |
| 9 to 11 feet | <u>Volatile TCLs</u> | | | | | | |
| | Toluene (<0.67) | N/A | N/A | N/A | 2.9 | 0.9 | 8.4 |
| | Ethylbenzene (<0.67) | N/A | N/A | N/A | 0.5J | 0.1J | 1.1 |
| | total Xylenes (<0.67) | N/A | N/A | N/A | 0.5J | 0.08 | 0.8 |
| | Total Volatile TCLs | N/A | N/A | N/A | 3.9 | 1.08 | 10.3 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

⁽¹⁾Sample identification in a combination of sample boring location and depth interval (e.g. APS 1 @ 4 to 6 feet is sample APS-146). Analytical detection levels are presented in parenthesis for each compound.

⁽²⁾Samples AP/SS-1, AP/SS-2, and AP/SS-3 were collected in May 1990 and analyzed for full scan volatiles.

⁽³⁾Samples AP/SS-4, AP/SS-5, and AP/SS-6 were collected in April 1991 and analyzed for benzene, ethylbenzene, toluene, xylenes (BTEX) only.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

TCL = Target Compound List.

Table 5.10. Summary of Analytical Results of Semivolatile Organic Compounds for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Indentification Number | | |
|--------------------------|----------|------------------------------------|----------|----------|
| | | APS
1 | APS
2 | APS
3 |
| <u>Semivolatile TCLs</u> | | | | |
| 4 to 6 feet | Phenol | 56 J | 840 | ND |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

Analytical detection levels were 0.4 mg/kg for base/neutral compounds and 0.66 mg/kg for acid compounds.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples were collected in May 1990 and analyzed for full scan semivolatiles (EPA Method 625 with library search).

There was no request for semivolatile analysis in the April 1991 sampling.

Table 5.11. Summary of Analytical Results of PCBs for Soil Boring Samples from the Former AP/Sterox Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Indentification Number | | | | | |
|--------------|--------------|------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | | APS ⁽²⁾
1 | APS ⁽²⁾
2 | APS ⁽²⁾
3 | APS ⁽³⁾
4 | APS ⁽³⁾
5 | APS ⁽³⁾
6 |
| 4 to 6 feet | <u>PCBs</u> | | | | | | |
| | Aroclor 1248 | 220 | 630 | 4 | 5.7 | 83 | N/A |
| | Aroclor 1260 | 36 | 78 | 10 | 2.6 | 28 | N/A |
| | Total PCBs | 256 | 708 | 14 | 8.3 | 111 | N/A |
| 9 to 11 feet | <u>PCBs</u> | | | | | | |
| | Aroclor 1248 | N/A | N/A | N/A | 5.5 | 1.4 | 27 |
| | Aroclor 1260 | N/A | N/A | N/A | 2.8 | 0.5 | 2.6 |
| | Total PCBs | N/A | N/A | N/A | 8.3 | 1.9 | 29.6 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

⁽²⁾Samples AP/SS-1, AP/SS-2, and AP/SS-3 were collected in May 1990 and analyzed for PCB Aroclors.

⁽³⁾Samples AP/SS-4, AP/SS-5, and AP/SS-6 were collected in April 1991 and analyzed for PCB Aroclors.

J = Result is an estimated concentration.

ND = Not detected.

N/A = Not analyzed.

Table 5.12. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former AP/Sterox Sump. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | TAL Parameters | Soil Boring Identification Number | | | |
|--------------|----------------------|-----------------------------------|--------|--------|--------|
| | | APS 1 | APS 2 | APS 3 | APS 3* |
| 4 to 6 feet | Aluminum (29.8) | 6450 | 5130 | 2630 | 3260 |
| | Antimony (45.4) | 13.4 J | 12.0 J | 10.4 J | 11.5 J |
| | Arsenic (47.9) | 11.5 J | 3.2 | 2.8 | 2.8 |
| | Barium (0.7) | 120.0 | 42.8 B | 17.1 B | 20.8 B |
| | Beryllium (0.3) | 1.9 | 1.7 | 0.1 B | 0.2 B |
| | Cadmium (4.5) | 1.3 J | 1.2 J | 1.0 J | 1.1 J |
| | Calcium (25.8) | 25500 | 5490 | 18300 | 8730 |
| | Chromium (3.7) | 68.0 | 40.1 | 5.9 | 7.2 |
| | Cobalt (5.1) | 15.0 | 10.5 B | 2.8 B | 4.6 B |
| | Copper (2.3) | 316 | 151 | 11.2 | 17.7 |
| | Iron (13.5) | 25400 | 18300 | 7500 | 10000 |
| | Lead (48.1) | 380 | 166 | 13.2 | 20.6 J |
| | Magnesium (96.3) | 3380 | 4590 | 130 | 1680 |
| | Manganese (0.8) | 606 | 276 | 130.0 | 132 |
| | Mercury (0.2) | 1.8 | 0.7 | 0.1 J | 0.1 J |
| | Nickel (24.2) | 154 | 60.8 | 7.8 B | 10.3 |
| | Potassium (2048) | 1220 B | 543 J | 470 J | 519 J |
| | Selenium (74.4) | 0.7 B | 0.6 B | 0.5 B | 0.5 J |
| | Silver (3.2) | 0.9 J | 0.9 B | 0.7 J | 0.8 B |
| | Sodium (1814) | 764 B | 481 J | 416 J | 459 J |
| | Thallium (218) | 0.6 J | 0.5 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 33.5 | 27.6 | 7.8 B | 22.3 |
| | Zinc (3.3) | 1470 | 591 | 65 | 79 |
| | Cyanide, total (0.5) | ND | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parentheses for each parameter.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. APS 1 @ 4 to 6 feet is sample APS-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

* Field duplicate sample.

Samples were collected between 4 and 6 feet below ground surface on May 14, 1990.

Samples collected on April 4 were not analyzed for inorganic parameters.

Table 5.13. Summary of Analytical Results of Organic Compounds for Soil Boring Samples from the Former Acid Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Depth | Analysis | Soil Boring Identification Number | | |
|--------------|---------------------------------|-----------------------------------|--------|--------|
| | | AS 1 | AS 2 | AS 3 |
| 4 to 6 feet | <u>Volatile TCLs</u> | | | |
| | Acetone (0.01) | 0.02 | ND | ND |
| | <u>Semivolatile TCLs</u> | ND | ND | ND |
| | <u>PCBs</u> | | | |
| | Aroclor 1248 (<0.1) | ND | 0.04 J | 0.01 J |
| | Aroclor 1260 (<0.2) | ND | 0.09 J | 0.03 J |
| | Total PCBs | ND | 0.13 | 0.04 |

Results are reported in milligrams/kilograms (mg/kg) or ppm.

The analytical detection levels are presented in parenthesis for each compound.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. ASP 1 @ 4 to 6 feet is sample AS-146).

J = Result is an estimated concentration.

ND = Not detected.

TCL = Target Compound List.

Samples AS-1, AS-2, and AS-3 were collected in May 1990 and analyzed volatiles and semivolatiles and PCBs.

Table 5.14. Summary of Analytical Results of Inorganic Parameters for Subsurface Soil Samples from the Former Acid Sump Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Depth | TAL Parameters | Sample Identification Number | | |
|-------------|----------------------|------------------------------|---------|---------|
| | | AS
1 | AS
2 | AS
3 |
| 4 to 6 feet | Aluminum (29.8) | 4650 | 183 | 203 |
| | Antimony (45.4) | 11.1 J | 11.5 J | 10.6 J |
| | Arsenic (47.9) | 5.6 | 4.9 | 0.8 B |
| | Barium (0.7) | 15.0 B | 2.2 B | 3.1 B |
| | Beryllium (0.3) | 0.2 J | 0.1 J | 0.1 J |
| | Cadmium (4.5) | 1.1 J | 1.1 J | 1.1 J |
| | Calcium (25.8) | 1390 | 100 B | 248 B |
| | Chromium (3.7) | 13.1 | 1.0 J | 0.9 J |
| | Cobalt (5.1) | 1.2 J | 1.3 J | 1.2 J |
| | Copper (2.3) | 11.8 | 7.0 | 2.6 B |
| | Iron (13.5) | 9820 | 307 | 216 |
| | Lead (48.1) | 11.4 J | 12.1 J | 11.2 J |
| | Magnesium (96.3) | 277 B | 66.2 B | 77.7 J |
| | Manganese (0.8) | 38.0 | 13.8 | 4.3 |
| | Mercury (0.2) | 0.1 J | 0.1 J | 0.1 J |
| | Nickel (24.2) | 5.9 J | 6.1 J | 5.7 J |
| | Potassium (2048) | 3370 | 517 J | 479 J |
| | Selenium (74.4) | 0.5 J | 0.5 J | 0.5 J |
| | Silver (3.2) | 0.8 J | 0.8 J | 0.8 J |
| | Sodium (1814) | 442 J | 458 J | 424 J |
| | Thallium (218) | 0.5 J | 0.5 J | 0.5 J |
| | Vanadium (3.9) | 12.2 | 1.0 J | 0.9 J |
| | Zinc (3.3) | 65 | 4.1 B | 4.2 B |
| | Cyanide, total (0.5) | ND | ND | ND |

Results are reported in milligrams per kilogram (mg/kg) or parts per million.

Analytical detection levels are presented in parenthesis.

⁽¹⁾Sample identification is a combination of sample boring locations and depth intervals (e.g. AS 1 @ 4 to 6 feet is sample AS-146).

ND = Not detected.

J = Concentration is detected below the instrument detection limit and is an estimated concentration.

B = Compound was detected in the corresponding blank sample.

TAL = Target analyte list.

Samples were collected between 4 and 6 feet below ground surface on May 8, 1990.

Table 5.15. Summary of Analytical Results of PCBs (Aroclor 1248) for Soil Boring Samples from the PCB Disposal Area. Monsanto Kearny Plant; Kearny, New Jersey.⁽¹⁾

| Sample Interval Depth (feet) Below
Ground Surface | Sample Identification Number | |
|------------------------------------------------------|------------------------------|--------------|
| | PDA-1 | PDA-2 |
| 16 - 18 | 1100 {130} | 0.97 {0.15} |
| 18 - 20 | 5.7 {0.48} | 6.5 {1.0} |
| 20 - 22 | 52 {6.4} | 7.2 {0.96} |
| 22 - 24 | 100 {10} | 17 {2.0} |
| 24 - 26 | 92 {9.7} | 3.6 {0.92} |
| 24 - 28 | 88 {9.1} | 0.1 {0.97} |
| 28 - 30 | 32 {4.7} | 0.46 {0.095} |

Results are reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

The analytical detection limits are presented in parentheses for each sample.

⁽¹⁾Samples were collected on May 15 and 16, 1990.

**Table 5.16 Summary of Analytical Results of Non-Target Volatile and Semivolatile Organic Compounds for Subsurface Soil Samples.
Monsanto Kearny Plant; Kearny, New Jersey.**

| | Sample Identification Number | | | | | | | | | | | | | |
|------------------------------|------------------------------|----------------|--------------|-------------------|-----------|---------------|------------|-----------------|-----------------|-----------------|----------------|--------------|--------------|-------------|
| | APSS 146 | APSS 246 | APSS 346 | APSS 346
(dup) | AS 146 | AS 246 | AS 346 | SSP 146 | SSP 246 | SSP 346 | TSP 146 | TSP 246 | TSP 346 | TSP 446 |
| Volatile TICs | | | | | | | | | | | | | | |
| C-Isomer | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | 8 J | 443 J | 3 J | 2.5 J | ND | ND | ND | 33 J | 380 J | ND | ND | 3 J | 70 J | 16 J |
| C-10 Hydrocarbon Isomer | ND | ND | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5 J | ND | ND |
| C-3 Benzene | 23 J | ND | 8 J | 10 J | ND | ND | ND | 211 J | ND | ND | ND | ND | ND | 7 J |
| C-4 Benzene | 1 J | ND | 9 J | 6 J | ND | ND | ND | 37 J | ND | 1,400 J | ND | ND | ND | ND |
| 1,2,4-Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2 J |
| Hydrocarbon Unknowns | ND | ND | ND | ND | ND | ND | ND | 17 J | ND | ND | 19 J | ND | ND | ND |
| Unknowns | 9 J | 310 J | 23 J | 4 J | ND | ND | ND | 60 J | 1,311 J | 18,210 J | ND | ND | 35 J | 18 J |
| Total | 42 J | 753 J | 44 J | 23 J | ND | ND | ND | 358 J | 1,691 J | 19,610 J | 19 J | 8 J | 105 J | 43 J |
| Semivolatile TICs | | | | | | | | | | | | | | |
| C-9 Hydrocarbon Isomer | ND | 3 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 Hydrocarbon Isomer | ND | 1 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | 47 J | 8 J | ND | ND | ND | ND | ND | ND | 65 J | 340 J | ND | ND | ND | 25 J |
| C-4 Benzene | ND | 9 J | ND | ND | ND | ND | ND | ND | 110 J | ND | ND | ND | ND | ND |
| nonyl Phenol | ND | 41 J | ND | 250 J | ND | ND | ND | 1700 J | ND | 1,100 J | 1,070 J | 216 J | 390 J | ND |
| 4(1-methyl-1-phenyl) Phenol | ND | ND | 41 J | ND | ND | ND | ND | 620 J | ND | 1,800 J | ND | ND | ND | ND |
| 4 Dodecyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 2,000 J | 4,700 J | ND | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | ND | 270 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1,3 | ND | 510 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | ND | 48 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetramethyl Butyl Phenol | ND | 110 J | ND | 180 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon Isomers | ND | ND | ND | ND | ND | ND | ND | ND | 84 J | 500 J | ND | ND | 420 J | ND |
| Unknowns | 815 J | 709 J | 519 J | 1,598 J | ND | 0.04 J | 0 J | 12,960 J | 11,430 J | 7,300 J | ND | ND | ND | ND |
| Total | 862 J | 1,421 J | 519 J | 2,298 J | ND | 0.04 J | 0 J | 15,280 J | 13,689 J | 15,640 J | 1,070 J | 216 J | 810 J | 25J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 8, 1990.

AS = Acid Sump Area.

APSS = AP/Sterox Sump Area

SSP = Secondary Settling Pond.

TSP = Tertiary Settling Pond.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively identified compounds from the library search.

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Table 5.17. Summary of Analytical Results of Volatile Organic Compounds and PCBs for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

Page 1 of 2

| | Sample Identification Number | | | | | | | | | |
|--------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|------------|-----------|-------------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TCL Volatile Organic Compounds | | | | | | | | | | |
| Acetone (0.01) | 0.058 Bd | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Ethylbenzene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Methylene Chloride (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Tetrachloroethene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Toluene (0.005) | ND d | ND | 71 d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Trichloroethene (0.005) | ND d | ND | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Xylenes (total) (0.005) | ND d | ND | 17 Jd | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| PCBs | | | | | | | | | | |
| Aroclor 1248 | 0.7 {0.86} | ND {0.91} | 6.4 {4.6} | 32 {9.0} | 1.2 {0.88} | 120 {9.5} | ND {0.87} | 1.4 {0.43} | 79 {8.9} | 0.7 {0.86}J |
| Aroclor 1260 | 4.6 {18.0} | 4.2 {1.8} | ND {9.2} | ND {18.0} | 3.5 {1.8} | 39 {19} | 3.6 {1.7} | 5.3 {0.87} | 20 {18} | ND {1.7} |

Notes:

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

B = Compound is also Detected in the Method Blank.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not Detected.

N/A = Not Applicable.

d = Detection limits raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

Samples were collected on May 22, 1990.

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Table 5.17. Summary of Analytical Results of Volatile Organic Compounds and PCBs for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

Page 2 of 2

| | Sample Identification Number | | | | | | | | |
|--------------------------------|------------------------------|------------|------------|-----------|-----------|-----------|-------------|------------|------------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| TCL Volatile Organic Compounds | | | | | | | | | |
| Acetone (0.01) | 0.66 JBd | ND | ND | ND d | 0.047 JBd | ND d | 0.11 Bd | 0.021 Bd | 0.06 Bd |
| Ethylbenzene (0.005) | ND d | ND | ND | ND d | ND d | 1.2 d | ND d | ND d | ND d |
| Methylene Chloride (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | ND d | ND d |
| Tetrachloroethene (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | 0.031 d | ND d |
| Toluene (0.005) | ND d | ND | ND | ND d | ND d | 0.11 Jd | 0.13 d | ND d | ND d |
| Trichloroethene (0.005) | ND d | ND | ND | ND d | ND d | ND d | ND d | 0.013 d | ND d |
| Xylenes (total) (0.005) | ND d | ND | ND | ND d | ND d | 0.37 Jd | ND d | ND d | ND d |
| PCBs | | | | | | | | | |
| Aroclor 1248 | 2500 {170} | 1.6 {0.47} | 1.7 {0.89} | ND {0.99} | ND {9.7} | 1.3 {0.9} | 1.7 {0.087} | 7.6 {0.92} | 6.6 {0.94} |
| Aroclor 1260 | ND {340} | 0.9 {0.93} | ND {1.8} | 16 {2.00} | 85 {19} | 1 {1.8} | 1.1 {1.7} | 8.1 {1.80} | 5.6 {1.9} |

Notes:

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected May 22, 1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample.

B = Compound is also Detected in the Method Blank.

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not Detected.

N/A = Not Applicable.

d = Detection limits raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

Samples were collected on May 22, 1990.

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Table 5.18. Summary of Analytical Results of Semivolatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

Page 1 of 2

| | Sample Identification Number | | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-0 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TCL Semi-Volatile Organic Compounds | | | | | | | | | | |
| Phenol (0.66) | ND d | ND d | 7.4 Jd | ND d | ND d | 6.3 Jd | ND | 1.2 Jd | ND d | ND d |
| 1,2,4-Trichlorobenzene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Naphthalene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.13 J | ND d | ND d | 0.5 Jd |
| 2-Methylnaphthalene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 0.4 Jd |
| bis (2-Ethylhexyl) Phthalate (0.66) | 1 Bd | 0.9 JBd | 3.3 JBd | ND d | 1.9 JBd | 2.8 JBd | 0.8 B | 1.6 JBd | 8.4 JBd | 1.7 Bd |
| Butyl Benzyl Phthalate (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 1 | ND d | ND d | ND d |
| Di-n-butyl Phthalate (0.66) | ND d | ND d | ND d | ND d | ND d | 25 Jd | 0.1 J | ND d | ND d | ND d |
| Dibenzofuran (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.3 Jd |
| Acenaphthene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | ND d |
| Acenaphthylene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 0.3 Jd |
| Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.1 J | ND d | ND d | 2.1 d |
| Benzo(a)Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | 2 Jd | 0.5 J | 7.2 d | ND d | 2.5 d |
| Benzo(a)Pyrene (0.66) | 0.1 Jd | ND d | ND d | ND d | ND d | ND d | 0.5 J | 8 d | ND d | 1.9 d |
| Benzo(b)Fluoranthrene (0.66) | 0.2 JLd | ND d | ND d | ND d | 1.7 JLd | 1.9 JLd | 0.8 L | 14 Ld | ND d | 4.1 Ld |
| Benzo(k)Fluoranthrene (0.66) | ND Ld | ND d | ND d | ND d | ND Ld | ND Ld | ND L | ND Ld | ND d | ND Ld |
| Benzo(g,h,i)Perylene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.3 J | 4.6 d | ND d | 0.9 Jd |
| Chrysene (0.66) | 0.2 Jd | ND d | ND d | ND d | 2 Jd | 2.1 Jd | 0.6 J | 7.4 d | ND d | 2.5 d |
| Dibenz(a,h)Anthracene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.6 Jd |
| Fluoranthene (0.66) | 0.3 Jd | ND d | ND d | ND d | ND d | 5.1 Jd | 1 | 9.9 d | ND d | 5.7 d |
| Fluorene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | ND | ND d | ND d | 0.3 Jd |
| Indeno(1,2,3-cd)Pyrene (0.66) | ND d | ND d | ND d | ND d | ND d | ND d | 0.3 J | 0.7 Jd | ND d | 0.3 Jd |
| Phenanthrene (0.66) | 0.2 Jd | ND d | ND d | ND d | ND d | 2.7 Jd | 0.3 J | 1.2 Jd | ND d | 3.3 d |
| Pyrene (0.66) | 0.2 Jd | ND d | ND d | ND d | 2.5 Jd | 4.9 Jd | 0.9 | 9.9 d | ND d | 4.4 d |

Notes:

Concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

J = Concentration is detected below the detection limit or is an estimated concentration.

B = Compound is also detected in the method blank.

ND = Not detected.

L = These components are not separable using this method and are therefore quantitated together.

d = Detection levels raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

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Table 5.18. Summary of Analytical Results of Semivolatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

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| | Sample Identification Number | | | | | | | | |
|-------------------------------------|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| TCL Semi-Volatile Organic Compounds | | | | | | | | | |
| Phenol (0.66) | ND d | 0.9 Jd | 0.9 Jd | 2.8 | 0.5 J | ND d | ND d | 1.4 Jd | 1.5 Jd |
| 1,2,4-Trichlorobenzene (0.66) | ND d | ND Jd | ND d | 0.2 J | 1.3 | ND Jd | ND d | ND d | ND d |
| Naphthalene (0.66) | ND d | 1.2 Jd | 1.1 Jd | 0.3 J | 0.5 J | 0.2 Jd | ND d | 0.3 Jd | ND d |
| 2-Methylnaphthalene (0.66) | ND d | 0.7 Jd | ND d | 0.3 J | 0.5 J | 0.2 d | ND d | ND d | ND d |
| bis (2-Ethylhexyl) Phthalate (0.66) | ND d | 0.8 JBd | 1.4 JBd | 0.9 BJ | 0.9 B | 0.9 JBd | 4.2 JBd | 1.1 JBd | 2.8 Bd |
| Butyl Benzyl Phthalate (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | ND d | ND d |
| Di-n-butyl Phthalate (0.66) | ND d | ND d | ND d | 0.2 J | 0.1 J | ND d | ND d | ND d | ND d |
| Dibenzofuran (0.66) | ND d | ND d | ND d | 0.1 J | ND | ND d | ND d | ND d | ND d |
| Acenaphthene (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | 0.2 Jd | ND d |
| Acenaphthylene (0.66) | ND d | 0.7 Jd | 0.8 Jd | 0.1 J | 0.1 J | ND d | ND d | ND d | ND d |
| Anthracene (0.66) | ND d | 0.5 Jd | ND d | ND | 0.1 J | ND d | ND d | 0.7 Jd | ND d |
| Benzo(a)Anthracene (0.66) | ND d | 1.8 Jd | ND d | ND | 0.3 J | ND d | ND d | 1.3 Jd | ND d |
| Benzo(a)Pyrene (0.66) | ND d | 1.8 Jd | 1.8 Jd | 0.2 J | 0.3 J | 0.2 Jd | ND d | 1.1 Jd | ND d |
| Benzo(b)Fluoranthrene (0.66) | ND d | 3.8 Ld | 3.5 Jd | 0.5 JL | 0.6 JL | 0.7 d | ND d | 1.7 Ld | ND d |
| Benzo(k)Fluoranthrene (0.66) | ND d | ND Ld | ND Ld | ND | ND L | ND Ld | ND d | ND Ld | ND d |
| Benzo(g,h,i)Perylene (0.66) | ND d | 1.1 Jd | ND d | 0.1 J | 0.2 J | ND d | ND d | 0.7 Jd | ND d |
| Chrysene (0.66) | ND d | 2 Jd | 1.8 Jd | 0.5 J | 0.7 | 1.6 Jd | ND d | 1.6 Jd | ND d |
| Dibenz(a,h)Anthracene (0.66) | ND d | 0.6 Jd | ND d | ND | 0.1 J | ND d | ND d | 0.3 Jd | ND d |
| Fluoranthene (0.66) | ND d | 2.7 Jd | 2.8 Jd | 0.3 J | 0.5 J | 0.5 Jd | ND d | 3.4 d | ND d |
| Fluorene (0.66) | ND d | ND d | ND d | ND | ND | ND d | ND d | ND d | ND d |
| Indeno(1,2,3-cd)Pyrene (0.66) | ND d | 1.2 Jd | ND d | 0.1 J | 0.2 J | ND d | ND d | 0.7 Jd | ND d |
| Phenanthrene (0.66) | ND d | 1.6 Jd | 1.5 Jd | 0.5 J | 0.9 | 0.4 Jd | ND d | 2.7 d | ND d |
| Pyrene (0.66) | ND d | 2.9 Jd | 2.7 Jd | 0.3 J | 0.5 J | 0.4 Jd | ND d | 3.2 d | ND d |

Notes:

Concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample

J = Concentration is detected below the detection limit or is an estimated concentration.

B = Compound is also detected in the method blank.

ND = Not detected.

L = These components are not separable using this method and are therefore quantitated together.

d = Detection levels raised due to high levels of other analytes or matrix interferences.

TCL = Target Compound List.

Samples were collected May 22, 1990.

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Table 5.19. Summary of Analytical Results of Inorganic Parameters for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

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| | Sample Identification Number | | | | | | | | | |
|------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| TAL Metals | | | | | | | | | | |
| Aluminum (29.8) | 4620.0 | 7770.0 | 10200.0 | 7000.0 | 8010.0 | 7560.0 | 5130.0 | 5380.0 | 7130.0 | 8190.0 |
| Antimony (45.4) | 9.7 J | 10.4 J | 10.5 J | 10.3 J | 9.9 J | 10.8 J | 9.8 J | 9.8 J | 29.3 J | 9.8 J |
| Arsenic (47.9) | 4.1 J | 2.2 J | 6.0 J | 5.3 J | 9.4 J | 6.0 J | 5.1 J | 9.5 J | 4.5 J | 10.8 J |
| Barium (0.7) | 49.1 | 79.0 | 34.5 | 39.7 | 74.6 | 162.0 | 49.6 | 54.5 | 66.3 | 183.0 |
| Beryllium (0.3) | 0.4 J | 0.31 | 0.81 | 0.3 | 0.4 | 4.0 | 0.3 J | 0.3 | 0.7 | 0.7 |
| Cadmium (4.5) | 1.0 J | 1.0 J | 1.0 J | 1.0 J | 1.0 J | 1.1 J | 1.0 J | 1.0 J | 1.2 J | 1.0 J |
| Calcium (25.8) | 5280.0 | 5460.0 | 6350.0 | 2920.0 | 5540.0 | 8370.0 | 6660.0 | 6170.0 | 8020.0 | 18000.0 |
| Chromium (3.7) | 26.1 | 29.9 | 24.0 | 21.6 | 20.1 | 92.9 | 18.9 | 17.1 | 48.0 | 369.0 |
| Cobalt (5.1) | 4.2 B | 2.7 J | 13.4 | 9.2 | 34.6 | 31.1 | 5.8 | 6.3 | 10.9 | 9.1 |
| Copper (2.3) | 72.7 | 48.4 | 68.5 | 60.8 | 99.9 | 645.0 | 36.8 | 62.2 | 115.0 | 142.0 |
| Iron (13.5) | 17900.0 | 21900.0 | 34900.0 | 28000.0 | 30100.0 | 32400.0 | 17000.0 | 16200.0 | 23700.0 | 23300.0 |
| Lead (48.1) | 114.0 | 73.3 | 58.7 | 90.1 | 148.0 | 676.0 | 60.7 | 89.2 | 200.0 | 270.0 |
| Magnesium (96.3) | 1140.0 | 960.0 | 6040.0 | 4430.0 | 4380.0 | 2980.0 | 2690.0 | 2660.0 | 6190.0 | 7270.0 |
| Manganese (0.8) | 143.0 | 97.3 | 439.0 | 236.0 | 464.0 | 347.0 | 226.0 | 172.0 | 317.0 | 453.0 |
| Mercury (0.2) | 0.3 | 0.2 | 0.5 | 0.4 | 0.8 | 1.2 | 0.3 | 0.2 | 0.4 | 74.0 |
| Nickel (24.2) | 22.0 J | 14.6 J | 14.8 J | 24.4 | 41.2 | 267.0 | 14.7 J | 21.5 J | 54.3 | 41.5 |
| Potassium (2048) | 1820.0 J | 3200.0 | 106.0 J | 1230.0 J | 1080.0 J | 940.0 J | 1150.0 J | 1040.0 J | 3630.0 | 1220.0 J |
| Selenium (74.4) | 0.4 J | 0.5 J | 0.5 J | 0.5 J | 0.5 J | 1.8 J | 0.4 J | 0.6 J | 0.5 J | 0.7 J |
| Silver (3.2) | 0.7 J | 0.7 J | 0.7 J | 0.7 J | 0.7 J | 0.8 J | 0.7 J | 0.7 J | 0.7 J | 0.7 J |
| Sodium (1814) | 392.0 J | 1840.0 | 418.0 J | 410.0 J | 397.0 J | 1430.0 J | 411.0 | 722.0 J | 578.0 J | 392.0 J |
| Thallium (218) | 0.4 J | 0.5 J | 0.5 J | 0.5 J | 0.4 J | 0.5 J | 0.4 J | 0.4 J | 0.5 J | 0.4 J |
| Vanadium (3.9) | 19.3 | 30.2 | 68.4 | 46.2 | 62.5 | 39.1 | 26.9 | 35.5 | 54.2 | 52.3 |
| Zinc (3.3) | 215.0 | 156.0 | 126.0 | 139.0 | 182.0 | 3380.0 | 143.0 | 89.8 | 424.0 | 249.0 |
| Cyanide (0.5) | ND | 1.9 | ND | 0.70 | ND | ND | ND | ND | ND | ND |

Notes:

All concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument Detection Limit reported in parentheses

Samples were collected on May 22, 1990.

ACD = Acid Sump Area

APSS = AP/Sterox Sump area

B02 to B16 = Background Samples

ND = Not detected.

J = Concentration is detected below the detection limit or is an estimate concentration.

D = Detection limits are raised due to high levels of other analytes or Matrix Interferences.

B = Metal also found in method blank

TAL = Target Analyte List.

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Table 5.19. Summary of Analytical Results of Inorganic Parameters for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification Number | | | | | | | | |
|------------------|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03* | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-22-0S | TSP-SS-01 |
| Tal Metals | | | | | | | | | |
| Aluminum (29.8) | 10700.0 | 6370.0 | 6760.0 | 4070.0 | 3900.0 | 5900.0 | 11400.0 | 4800.0 | 6400.0 |
| Antimony (45.4) | 9.6 J | 10.6 J | 10.1 J | 11.2 J | 11.0 J | 22.7 J | 9.9 J | 10.6 J | 10.4 J |
| Arsenic (47.9) | 4.1 J | 14.4 J | 10.8 J | 20.0 J | 26.6 J | 15.0 J | 1.0 J | 14.7 J | 8.9 J |
| Barium (0.7) | 55.8 | 95.2 | 108.0 | 70.4 | 71.9 | 89.0 | 85.7 | 75.9 | 60.1 |
| Beryllium (0.3) | 0.4 | 0.5 | 0.6 | 0.5 | 0.6 | 0.4 | 1.9 | 0.3 J | 0.4 |
| Cadmium (4.5) | 1.0 J | 1.0 J | 1.1 J | 1.1 J | 1.1 J | 1.0 J | 1.0 J | 1.1 J | 1.0 J |
| Calcium (25.8) | 12100.0 | 3230.0 | 3870.0 | 2290.0 | 2050.0 | 4660.0 | 12900.0 | 5040.0 | 7150.0 |
| Chromium (3.7) | 43.4 | 26.4 | 24.7 | 22.0 | 55.7 | 37.9 | 69.9 | 130.0 | 230.0 |
| Cobalt (5.1) | 13.0 | 7.1 | 6.8 | 8.5 | 5.7 | 9.4 | 21.9 | 6.0 | 10.2 |
| Copper (2.3) | 87.9 | 76.8 | 71.6 | 95.0 | 74.0 | 155.0 | 375.0 | 68.2 | 76.4 |
| Iron (13.5) | 25400.0 | 27200.0 | 27700.0 | 21900.0 | 21200.0 | 23500.0 | 32300.0 | 16500.0 | 22200.0 |
| Lead (48.1) | 162.0 | 159.0 | 153.0 | 188.0 | 217.0 | 472.0 | 392.0 | 160.0 | 136.0 |
| Magnesium (96.3) | 9510.0 | 2210.0 | 2150.0 | 1270.0 | 880.0 | 2190.0 | 8770.0 | 2210.0 | 2850.0 |
| Manganese (0.8) | 315.0 | 572.0 | 338.0 | 243.0 | 170.0 | 310.0 | 382.0 | 249.0 | 461.0 |
| Mercury (0.2) | 0.6 | 1.4 | 1.1 | 0.3 | 0.4 | 0.9 | 0.4 | 0.6 | 0.3 |
| Nickel (24.2) | 34.3 | 14.2 J | 15.5 J | 15.5 J | 28.0 | 48.9 | 199.0 | 28.7 | 68.0 |
| Potassium (2048) | 435.0 J | 1240.0 J | 1600.0 J | 593.0 J | 838.0 J | 628.0 J | 1360.0 J | 1030.0 J | 1040.0 J |
| Selenium (74.4) | 0.4 J | 0.5 J | 0.4 J | 1.0 J | 1.0 J | 1.1 J | 0.4 J | 0.5 J | 0.5 J |
| Silver (3.2) | 0.7 J | 0.8 J | 0.7 J | 0.8 J | 0.8 J | 0.7 J | 0.7 J | 0.8 J | 0.7 J |
| Sodium (1814) | 386.0 J | 422.0 J | 403.0 J | 448.0 J | 440.0 J | 410.0 J | 637.0 J | 425.0 J | 416.0 J |
| Thallium (218) | 0.4 J | 0.5 J | 0.4 J | 0.5 J | 0.6 J | 0.5 J | 0.4 J | 0.5 J | 0.5 J |
| Vanadium (3.9) | 53.8 | 50.4 | 46.1 | 31.9 | 49.6 | 114.0 | 51.3 | 53.5 | 128.0 |
| Zinc (3.3) | 145.0 | 154.0 | 161.0 | 397.0 | 146.0 | 480.0 | 1300.0 | 176.0 | 147.0 |
| Cyanide (0.5) | ND | ND | ND | ND | 0.86 | ND | ND | ND | ND |

Notes:

All concentrations reported in milligrams per kilograms (mg/kg) or parts per million (ppm).

Instrument Detection Limit reported in parentheses

Samples were collected on May 22,1990.

PDA = PCB Disposal Area

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

* Duplicate sample.

ND = Not detected.

J = Concentration is detected below the detection limit or is an estimate concentration.

D = Detection limits are raised due to high levels of other analytes or Matrix Interferences.

B = Metal also found in method blank

TAL = Target Analyte List.

Samples were collected on May 22, 1990

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Table 5.20. Summary of Analytical Results of Non-Target Volatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification Number | | | | | | | | | |
|-----------------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-01 | B16-SS-01 |
| Volatile TICs | | | | | | | | | | |
| 1H-Indene,2,3-dihydro-1,1,3 | ND | 0.3 J | ND | ND | ND | ND | 0.4 J | ND | ND | ND |
| Butylhepthybenzene | ND | ND | ND | ND | ND | ND | 1 J | ND | ND | ND |
| C-14 H-20 O-2 Isomer | ND | ND | 280 J | 15 J | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C10 Hydrocarbon Isomer | ND | ND | 2,100 J | ND | 0.3 J | ND | ND | ND | ND | ND |
| C9 Hydrocarbon Isomer | ND | ND | ND | ND | 6.4 J | ND | ND | ND | ND | ND |
| Dimethyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Propylnonyl Benzene | ND | ND | ND | ND | ND | ND | 0.1 J | ND | ND | ND |
| Trichlorofluoromethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 0.1 J | ND | 4,691 J | 501.9 J | 6.1 J | 6.4 J | 0.8 J | ND | ND | ND |
| Total | 0.1 J | 0.3 J | 7,071 J | 516.9 J | 12.8 J | 6.4 J | 2.3 J | ND | ND | ND |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 22,1990.

ACD = Acid Sump Area.

APS = Alkyl Phenol Structure.

APSS = AP/Sterox Sump Area.

B02 to B16 = Background Samples

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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Table 5.20 Summary of Analytical Results of Non-Target Volatile Organic Compounds for Surface Soil Samples. Monsanto Kearny Plant. Kearny, New Jersey.

| | Sample Identification Number | | | | | | | | |
|-----------------------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03 | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| Volatile TICs | | | | | | | | | |
| 1H-Indene,2,3-dihydro-1,1,3 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Butylheptybenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-14 H-20 O-2 Isomer | ND | ND | ND | ND | ND | ND | ND | 0.1 J | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | 110.0 J | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | 11.6 J | ND | ND | ND |
| C10 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | 8.4 J | ND | ND | ND |
| Dimethyl Naphthalene Isomer | 2.8 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Propylnonyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichlorofluoromethane | ND | 0.01 J | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 16.9 J | 0.1 J | 0.1 J | 0.1 J | 1.56 J | 24.5 J | 5 J | ND | 0.4 J |
| Total | 19.7 J | 0.11 J | 0.1 J | 0.1 J | 1.5 J | 154.5 J | 5 J | 0.1 J | 0.4 J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Samples were collected on May 22,1990.

* Duplicate sample.

PDA = PCB Disposal Area.

SSS = Sterox Building

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

J = Compound is detected below the detection limit or is an estimated concentration.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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**Table 5.21. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds for Surface Soil Samples.
Monsanto Kearny Plant. Kearny, New Jersey.**

| | Sample Identification Number | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | PDA-SS-01 | PDA-SS-02 | PDA-SS-03 | SSP-SS-01 | SSP-SS-02 | SSS-SS-01 | SSS-SS-02 | TSP-SS-01 | TSP-SS-02 |
| Semivolatile TICs | | | | | | | | | |
| 1,2-Benzenedicarboxylic Acid, Butyl | ND | ND | 6.6 J | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1,3 | ND | 55 J | ND | ND | ND | ND | ND | ND | ND |
| 4-(1,1,3,3-Tetramethylbutyl)-Phenol | ND | 5.4 J | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl)-Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Dodecyl Phenol | ND | ND | ND | ND | ND | 1.6 J | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | ND | ND | ND | ND | ND | 3.3 J | ND |
| 4-Phenyl Bicyclohexyl | ND | ND | ND | ND | ND | 2 J | ND | ND | ND |
| C-1 Benzene | ND | ND | ND | 1 J | ND | ND | ND | ND | ND |
| C-15 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | 1 J | ND |
| C-20 H-12 Isomer | ND | 2.3 J | ND | ND | ND | ND | ND | 1 J | ND |
| C-3 Benzene | ND | ND | 5.9 J | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bimethyl Naphthalene | ND | ND | ND | ND | 1.2 J | ND | ND | ND | ND |
| Heptachloro,1,1-Biphenyl | ND | ND | ND | 4 J | 9.4 J | ND | ND | ND | ND |
| Hexachloro,1,1-Biphenyl | 42 J | ND | ND | 5 J | 11.7 J | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | 3 J | 6.4 J | ND | ND | ND | ND |
| Nonyl Phenol | ND | ND | 3 J | ND | ND | ND | ND | ND | ND |
| Octachloro,1,1-Biphenyl | ND | ND | ND | ND | 2 J | ND | ND | ND | ND |
| Pentachloro,1,1-Biphenyl | 514 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, Mol. (S8) | ND | ND | ND | 2.3 J | ND | ND | ND | ND | ND |
| Tetrachloro Benzene | ND | ND | ND | ND | 3.5 J | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | 1,551 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Trichloro,1,1-Biphenyl | 100 J | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | 4 J | ND | 1 J | ND | 1 J | ND | 4 J | ND |
| Unknowns | ND | 41.5 J | 161 J | 53.6 J | 54.3 J | 20 J | 3,230 J | 41 J | 763 J |
| Total | 2,207 J | 108.2 Jd | 177 J | 69.9 J | 88.5 J | 24.6 J | 3,230 J | 50.3 J | 763 J |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples collected on May 22, 1990.

* Duplicate sample.

PDA = PCB Disposal Area.

SSS = Sterox Building.

SSP = Secondary Settling Pond

TSP = Tertiary Settling Pond

J = Concentration is detected below the detection limit or is an estimated concentrations.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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Table 5.21. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds for Surface Soil Samples.
Monsanto, Kearny Plant. Kearny, New Jersey.

| | Sample Identification Number | | | | | | | | | |
|-------------------------------------|------------------------------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| | ACD-SS-01 | ACD-SS-02 | APS-SS-01 | APS-SS-02 | APSS-SS-01 | APSS-SS-02 | B02-SS-01 | B10-SS-01 | B14-SS-02 | B16-SS-01 |
| Semivolatile TICs | | | | | | | | | | |
| 1,2-Benzenedicarboxylic Acid, Butyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1H-Indene, 2,3-Dihydro-1,1,3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1,1,3,3-Tetramethylbutyl)-Phenol | ND | ND | 230 J | 510 J | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl)-Phenol | ND | ND | 52 J | ND | ND | ND | ND | ND | ND | ND |
| 4-Dodecyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Nonyl Phenol | ND | ND | 310 J | 2,140 J | ND | ND | ND | ND | 1,100 J | ND |
| 4-Phenyl Bicyclohexyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-1 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-15 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-20 H-12 Isomer | ND | ND | ND | ND | ND | ND | 0.4 J | 6.2 J | ND | 1.5 J |
| C-3 Benzene | ND | ND | 68 J | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | 85 J | ND | ND | ND | ND | ND | ND | ND |
| Bimethyl Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachloro,1,1-Biphenyl | 0.3 J | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hexachloro,1,1-Biphenyl | 0.2 J | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | 7.1 J | ND | ND | 2.5 J |
| Nonyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Octachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Pentachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | 21 J | ND | ND | ND | ND |
| Substituted Benzene | ND | 257 J | ND | ND | ND | ND | ND | 10.5 J | ND | ND |
| Sulfur, Mol. (S8) | 0.2 J | ND | ND | ND | ND | ND | ND | ND | ND | 2.5 J |
| Tetrachloro Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Tetrachloro,1,1-Biphenyl | ND | ND | ND | ND | ND | 15 J | ND | ND | ND | ND |
| Trichloro,1,1-Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | 128 J | 720 J | ND | 378 J | ND | ND | ND | ND |
| Unknowns | 3.3 J | 57 J | 1,487 J | 7,146 J | 123 J | 1,524 J | 1.2 J | 10.1 J | 7,267 J | 5.3 J |
| Total | 4 Jd | 314 J | 2,360 J | 10,516 J | 123 J | 1,938 J | 8.7 J | 26.8 J | 8,367 J | 11.8 Jd |

Concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

Instrument detection limits indicated in parentheses.

Samples were collected on May 22, 1990.

ACD = Acid Sump Area.

APS = Alkyl Phenol Structure

APSS = AP/Sterox Sump Area.

B02 to B16 = Background Samples.

J = Concentration is detected below the detection limit or is an estimated concentrations.

ND = Not detected.

TICs = Tentatively Identified Compounds from the library search.

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Table 5.22 Summary of Analytical Results of Polycyclic Aromatic Hydrocarbons (PAHs) for Phase II Surface Soil Samples. Monsanto Kearny Plant; Kearny, New Jersey.

| TCL Semivolatile Organic Compounds | Sample Identification Number | | |
|------------------------------------|------------------------------|-------|------|
| | B-16* | B-16 | B-10 |
| Naphthalene (0.38) | BDL | 0.86 | 0.98 |
| Acenaphthene (0.38) | 4.6 | BDL | ND |
| Fluorene (0.38) | 3.9 | 0.42 | ND |
| Phenanthrene (0.38) | 3.2 | 4.2 | BDL |
| Anthracene (0.38) | 8.7 | 1.1 | ND |
| Fluoranthene (0.38) | 3.5 | 5.8 | BDL |
| Pyrene (0.38) | 31 | 5.4 | BDL |
| • Benzo (a) anthracene (0.38) | 16 | 2.5 | ND |
| • Chrysene (0.38) | 16 | 3.2 | 8.7 |
| • Benzo (b) fluoranthene (0.38) | 30 | 7.1 | ND |
| • Benzo (a) pyrene (0.38) | 14 | 2.3 | ND |
| • Indeno (1,2,3-cd) pyrene (0.38) | 9 | ND | ND |
| Totals | 116.9 | 32.02 | 8.7 |
| • Total CaPAHs | 85 | 15.1 | 8.7 |

All concentrations reported in milligrams per kilogram (mg/kg) or parts per million (ppb).

Instrument detection limits are reported in parentheses.

Samples were collected March 20, 1991.

J = Result is an estimated concentration.

ND = Not detected.

* Field duplicate sample.

BDL = Compound was detected below detection limit.

TCL = Target Compound List.

Duplicate sample B-16* was sent to the laboratory as blind field duplicate B-3.

• Carcinogenic Polycyclic Aromatic Hydrocarbons (CaPAHs).

**Table 6.1. Summary of Floating Product Thickness Measured in Observation Points.
Monsanto Kearny Plant, Kearny, New Jersey.**

| Observation
Point Number | Product Thickness ¹ | | | | |
|-----------------------------|--------------------------------|-------------|----------------|---------------|----------|
| | June 1990 | August 1990 | September 1990 | February 1991 | May 1991 |
| OB-A | Oil Sheen | -- | -- | -- | -- |
| OB-B | -- | -- | -- | -- | -- |
| OB-C | -- | -- | -- | -- | -- |
| OB-D | Oil Sheen | Oil Sheen | Oil Sheen | -- | -- |
| OB-E | -- | -- | -- | -- | -- |
| OB-7 | -- | -- | -- | -- | -- |
| OB-9 | 0.02 | 0.50 | 0.01 | 0.04 | > 0.01 |
| OB-11 | -- | -- | -- | -- | -- |
| OB-12 | -- | -- | -- | -- | -- |

¹ Product Thickness Measured in Feet.

-- = No Product Observed.

Table 6.2a. Summary of Upper Water-Bearing Zone Ground-Water Level Gauging Data. Monsanto Kearny Plant; Kearny, New Jersey.

| Well Number | Total Depth of Well ¹ (feet) | Screened Interval ¹ (feet) | Elevation of Monitoring Point ² (feet) | June 1990 | | August 1990 | | September 1990 | | December 1990 | | March 1991 | |
|-------------|-----------------------------------------|---------------------------------------|---------------------------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| | | | | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² |
| MW-1S | 12.80 | 7.80 - 12.80(5) | 10.73 | 3.57 | 7.16 | 3.20 | 7.53 | 3.62 | 7.11 | 3.40 | 7.33 | 3.92 | 6.81 |
| MW-3S | 10.40 | 5.40 - 10.40(5) | 11.25* | 4.79 | 6.46 | 3.47 | 7.78 | 5.16 | 6.09 | 4.67 | 6.58 | 4.53 | 6.72 |
| MW-4S | 10.30 | 5.30 - 10.30(5) | 11.55 | 5.15 | 6.40 | 4.23 | 7.32 | 4.82 | 6.73 | 5.15 | 6.40 | 4.85 | 6.70 |
| MW-5S | 9.10 | 4.10 - 9.10(5) | 11.81 | 5.76 | 6.05 | 4.57 | 7.24 | 5.88 | 5.93 | 5.91 | 5.90 | 5.32 | 6.49 |
| MW-6S | 10.60 | 5.60 - 10.60(5) | 11.75* | 6.08 | 5.67 | 5.68 | 6.07 | 6.25 | 5.50 | 6.15 | 5.60 | 5.88 | 5.87 |
| MW-7S | 9.64 | 4.64 - 9.64(5) | 10.37 | 4.25 | 6.12 | 3.62 | 6.75 | 4.41 | 5.96 | 4.68 | 5.69 | 3.92 | 6.45 |
| MW-8S | 10.32 | 5.32 - 10.32(5) | 8.83 | 6.65 | 2.18 | 6.24 | 2.59 | 6.39 | 2.44 | 6.50 | 2.33 | 7.18 | 1.65 |
| MW-9S | 15.00 | 10.00 - 15.00(5) | 10.88 | 5.04 | 5.84 | 4.03 | 6.85 | 5.19 | 5.69 | 4.42 | 6.46 | 4.52 | 6.36 |
| MW-10S | 15.00 | 10.00 - 15.00(5) | 12.15* | 5.86 | 6.29 | 3.98 | 8.17 | 5.99 | 6.16 | 5.81 | 6.34 | 5.55 | 6.60 |
| MW-11S | 14.00 | 9.00 - 14.00(5) | 9.97 | 3.64 | 6.33 | 2.82 | 7.15 | 1.46 | 8.51 | 4.50 | 5.47 | 4.06 | 5.91 |
| MW-12S | 15.00 | 10.00 - 15.00(5) | 10.46 | 4.75 | 5.71 | 3.56 | 6.90 | 5.10 | 5.36 | 4.23 | 6.23 | 4.43 | 6.03 |
| MW-13S | 10.00 | 3.00 - 10.00(7) | 10.02 | 3.71 | 6.31 | 3.32 | 6.70 | 4.81 | 5.21 | 4.87 | 5.15 | 4.55 | 5.47 |
| MW-14S | 10.00 | 3.00 - 10.00(7) | 10.71 | 5.03 | 5.68 | 4.75 | 5.96 | 5.15 | 5.56 | 5.15 | 5.56 | 5.07 | 5.64 |
| MW-15S | 15.00 | 5.00 - 15.00(10) | 8.68 | 2.23 | 6.45 | 1.85 | 6.83 | 2.86 | 5.82 | 2.55 | 6.13 | 2.02 | 6.66 |
| MW-16S | 13.00 | 3.00 - 13.00(10) | 11.35 | 5.98 | 5.37 | 5.63 | 5.72 | 6.09 | 5.26 | 6.05 | 5.30 | 5.75 | 5.60 |

¹ Feet below ground surface.

² Feet above mean sea level. Monitoring point surveyed by licensed surveyor to nearest 0.01 foot.

³ DTW = Depth to water, feet below monitoring point.

Length of well screens in parentheses.

* Measurements from top of steel casing. All other measurements are from PVC casing.

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Table 6.2b. Summary of Lower Water-Bearing Zone Ground-Water Level Gauging Data. Monsanto Kearny Plant; Kearny, New Jersey.

| Well Number | Total Depth of Well ¹ (feet) | Screened Interval ¹ (feet) | Elevation of Monitoring Point ² (feet) | June 1990 | | August 1990 | | September 1990 | | December 1990 | | March 1991 | |
|-------------|-----------------------------------------|---------------------------------------|---------------------------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| | | | | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² | DTW ³ (feet) | Water Elevation ² |
| MW-3D | 29.30 | 19.30 - 29.30(10) | 11.02* | 9.07 | 1.95 | 8.50 | 2.52 | 9.01 | 2.01 | 9.30 | 1.72 | 9.12 | 1.90 |
| MW-6D | 27.50 | 17.50 - 27.50(10) | 11.46 | 9.47 | 1.99 | 8.87 | 2.59 | 9.32 | 2.14 | 9.57 | 1.89 | 9.54 | 1.92 |
| MW-7D | 27.00 | 17.00 - 27.00(10) | 10.80 | 8.91 | 1.89 | 8.24 | 2.56 | 8.70 | 2.10 | 9.03 | 1.77 | 9.02 | 1.78 |
| MW-8D | 27.00 | 17.00 - 27.00(10) | 9.74 | 8.30 | 1.44 | 8.44 | 1.30 | 7.82 | 1.92 | 8.75 | 0.99 | 9.61 | 0.13 |
| MW-9D | 30.00 | 20.00 - 30.00(10) | 9.45* | 7.46 | 1.99 | 6.85 | 2.60 | 7.37 | 2.08 | 7.43 | 2.02 | 7.47 | 1.98 |
| MW-10D | 29.00 | 19.00 - 29.00(10) | 11.58 | 9.60 | 1.98 | 8.94 | 2.64 | 9.36 | 2.22 | 9.65 | 1.93 | 9.63 | 1.95 |
| MW-11D | 30.00 | 20.00 - 30.00(10) | 11.04 | 9.06 | 1.98 | 8.50 | 2.54 | 8.96 | 2.08 | 9.08 | 1.96 | 9.16 | 1.88 |
| MW-12D | 29.00 | 19.00 - 29.00(10) | 11.22 | 9.35 | 1.87 | 8.70 | 2.52 | 9.08 | 2.14 | 9.55 | 1.67 | 9.37 | 1.85 |
| MW-13D | 30.00 | 20.00 - 30.00(10) | 10.79 | 9.04 | 1.75 | 9.58 | 1.21 | 10.90 | -0.11 | 10.98 | -0.19 | 9.69 | 1.10 |
| MW-14D | 27.00 | 17.00 - 27.00(10) | 10.92 | 9.05 | 1.87 | 8.84 | 2.08 | 9.22 | 1.70 | 10.37 | 0.55 | 10.89 | 0.03 |
| MW-15D | 30.00 | 20.00 - 30.00(10) | 8.76 | 6.75 | 2.01 | 6.12 | 2.64 | 6.68 | 2.08 | 6.95 | 1.81 | 6.87 | 1.89 |

¹ Feet below ground surface.

² Feet above mean sea level. Monitoring point surveyed by licensed surveyor to nearest 0.01 foot.

³ DTW = Depth to water, feet below monitoring point.

Length of well screens in parentheses.

* Measurements from top of steel casing. All other measurements from top of PVC.

Table 6.3. Water-Level Elevation Data for MW-10D, MW-11D, and MW-13D for High and Low Tide. Monsanto Kearny Plant. Kearny, New Jersey.

| Well Designation | Distance from River
(Feet) | High Tide
Elevation⁽¹⁾ | Low Tide
Elevation⁽¹⁾ | Mean Elevation⁽²⁾ |
|-------------------------|---------------------------------------|----------------------------------------------|---------------------------------------------|-------------------------------------|
| MW-10D | 625 | 2.47 | 2.38 | 2.42 |
| MW-11D | 370 | 2.41 | 2.24 | 2.32 |
| MW-13D | 55 | 1.37 | -0.94 | 0.21 |

⁽¹⁾Elevations in feet relative to mean seal level in feet. Measured at high tide and low tide during midday tidal cycle of August 31, 1990.

⁽²⁾Average elevation between high and low tide.

Table 6.4 Summary of Analytical Results of Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | | 4s | | | | 6s | | | | 8s | | | |
|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------|------|------------------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | BDL ^b | ND | ND | ND | ND | ND | 10 | ND | ND | 14 | BDL ^b | ND | BDL ^b |
| Benzene | ND | ND | BDL | ND | ND | ND | ND | ND | ND | 5.1 | ND | BDL | ND | BDL | BDL | ND |
| Ethylbenzene | ND | ND | ND | ND | ND | ND | 6 | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND |
| Xylene | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | BDL | 6 | BDL | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | BDL | BDL | BDL |
| Carbon Disulfide | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| | 9s | | | | 11s | | | | 12s | | | | 15s | | | |
|------------------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------------------|------|-----------------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | 12 ^a | 15 | ND | ND | 12 ^a | 11 | ND | ND | BDL ^b | BDL | ND ^b | ND | BDL ^b |
| Benzene | ND | ND | ND | 19 | 140 | 7 | 60 | 320 ^d | ND | BDL | BDL | 12 | BDL | 11 | 10 | 12 ^f |
| Ethylbenzene | ND | ND | ND | ND | 69 | 23 | BDL | 44 ^f | ND | ND | ND | BDL | BDL | 10 | 9 | 15 ^f |
| Toluene | ND | ND | ND | ND | BDL | 6 | ND | 15 ^f | ND | ND | ND | ND | 8 | 27 | 22 | 22 ^f |
| Xylene | ND | ND | ND | ND | 12 | 3 | BDL | 10 | ND | BDL | NDL | BDL | 10 | 25 | 23 | 31 ^f |
| Chlorobenzene | ND | ND | ND | BDL | ND | BDL | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND |
| Carbon Disulfide | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 15 | ND | ND | ND | BDL |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

^fThe result is estimated below the detection level.

^bCompound was detected in the corresponding blank sample.

^dSample was diluted to bring concentrations in calibration range.

Results are reported in micrograms per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

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Table 6.5 Summary of Analytical Results of Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 6d | | | | 7d | | | | 8d | | | | 9d | | | |
|-----------------|------|------|------|------------------|------|------|------|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | BDL ^a | 11 | ND | ND | BDL ^a | BDL | ND | ND | BDL ^a | ND | ND | ND | ND | 58 | ND | ND | ND |
| Benzene | 19 | ND | NDL | ND | ND | ND | ND | ND | 19 | BDL | BDL | ND | 31 | 19 | BDL | 40 | BDL | 10 | BDL | BDL |
| Chlorobenzene | 4400 | 5600 | 5900 | 5300 | ND | ND | ND | ND | 810 | 830 | 760 | 810 | 960 | 620 | 820 | 590 | 660 | 600 | 400 | 500 |
| Chloroform | ND | ND | ND | ND | 10 | ND | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND |
| Ethylbenzene | 10 | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | BDL | ND | ND |
| Toluene | BDL | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | 7 | ND | ND | 22 | ND | ND | ND | ND |
| Xylenes (total) | 7 | ND | ND | ND | ND | ND | BDL | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND |

| | 10d | | | | 11d | | | | 12d | | | | 14d | | | | 15d | | | |
|-----------------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------|------|------------------|------|-----------------|------|------|------|-------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Acetone | ND | ND | ND | 76 ^a | 18 | 12 | ND | BDL ^a | 49 | 20 | ND | ND | BDL | BDL ^a | ND | ND | 20 | ND | ND | 71 ^a |
| Benzene | ND | ND | ND | BDL | 8 | BDL | BDL | 5.1 | BDL | BDL | ND | BDL | BDL | BDL ^a | BDL | BDL | 14 | ND | ND | BDL |
| Chlorobenzene | 2600 | 2300 | 2600 | 1500 | 54 | 48 | 55 | 39 | 15 | 140 | 510 | 650 | 75 | 61 | 82 | 62 ^a | 1200 | 4900 | 7000 | 3600 ^a |
| Chloroform | ND | ND | ND | ND | BDL | BDL | BDL | ND | BDL | ND | ND | ND | ND | ND | ND | ND | 18 | ND | ND | ND |
| Ethylbenzene | ND | ND | ND | ND | 8 | BDL | BDL | ND | ND | ND | ND | ND | BDL | BDL | ND | BDL | 5 | ND | ND | BDL |
| Toluene | ND | ND | ND | ND | 16 | BDL | ND | ND | BDL | ND | ND | ND | BDL | ND | ND | ND | 6 | ND | ND | BDL |
| Xylenes (total) | ND | ND | ND | ND | 6 | BDL | BDL | BDL | BDL | ND | ND | ND | ND | BDL | BDL | ND | 9 | ND | ND | BDL |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

^aThe result is estimated below the detection level.

^aCompound was detected in the corresponding blank sample.

Samples 3d (GW-1) and 10d (GW-3) were incorrectly labeled by the laboratory as samples 3s and 10s, respectively.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

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Table 6.6 Summary of Analytical Results of Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3s | | | | 6s | | | | 10s | | | | 11s | | | |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 290 | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ND | BDL | ND | ND | ND | ND | BDL | BDL | ND | ND | ND | ND | ND | ND | ND | ND |
| Naphthalene | ND | BDL | ND | ND | ND | 28 | 66 | BDL | ND | ND | ND | ND | BDL | ND | ND | BDL |
| Dimethyl phthalate | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | ND | ND | ND | ND | BDL | BDL | BDL | ND | BDL | ND | ND | ND | BDL | ND | ND | BDL |
| Acenaphthene | ND | ND | ND | ND | BDL | 25 | 24 | BDL | ND | BDL | BDL | ND | ND | BDL | BDL | BDL |
| 2-Methylnaphthalene | ND | ND | ND | ND | ND | BDL | BDL | ND | ND | ND | BDL | ND | ND | ND | ND | ND |
| Fluoranthene | ND | ND | ND | ND | BDL | BDL | BDL | BDL | BDL | ND | ND | ND | ND | ND | ND | ND |
| Fluorene | ND | ND | ND | ND | 10 | 21 | 22 | BDL | ND | BDL | BDL | ND | BDL | ND | ND | BDL |
| Phenanthrene | ND | ND | ND | ND | BDL | BDL | BDL | ND | 16 | BDL | BDL | ND | BDL | ND | ND | BDL |
| Pyrene | ND | ND | ND | ND | BDL | BDL | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND |

| | 13s | | | | 14s | | | | 15s | | | | 16s | | | |
|---------------------|------|------|------|------|------|------|------|-----------------|------|------|------|------------------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | 27 ¹ | BDL | ND | 13 | ND | ND | ND | ND | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 10 | 38 | 28 | 20 | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 14 | 46 | 32 | 18 | ND | ND | ND | ND |
| 2,4-Dimethylphenol | ND | ND | ND | ND | ND | ND | ND | ND | 17 | 73 | 44 | 28 | ND | ND | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | BDL | BDL | BDL | 51 | 410 | 380 | 250 ⁴ | ND | ND | ND | ND |
| Dimethyl phthalate | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzofuran | ND | ND | BDL | BDL | BDL | BDL | BDL | BDL | 16 | BDL | 20 | 11 | BDL | BDL | BDL | ND |
| Acenaphthene | BDL | 22 | 27 | 22 | 12 | 10 | BDL | BDL | 25 | 31 | 33 | 19 | BDL | BDL | BDL | 24 |
| 2-Methylnaphthalene | ND | BDL | BDL | BDL | ND | ND | ND | BDL | BDL | 29 | 28 | 17 | BDL | 25 | BDL | ND |
| Fluoranthene | ND | BDL | ND | BDL | ND | BDL | BDL | BDL | 19 | 11 | BDL | BDL | BDL | BDL | BDL | ND |
| Fluorene | ND | ND | ND | ND | BDL | BDL | BDL | BDL | 21 | 24 | 24 | 14 | BDL | BDL | ND | ND |
| Phenanthrene | BDL | BDL | BDL | BDL | BDL | ND | 12 | BDL | 34 | 32 | 26 | 14 | BDL | 24 | BDL | ND |
| Pyrene | ND | ND | ND | ND | ND | ND | ND | BDL | 17 | 10 | BDL | BDL | BDL | ND | BDL | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

⁴Sample was diluted to bring the concentration into calibration range.

Sample 3s (GW-1) was incorrectly labeled by the laboratory as sample 3d.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

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Table 6.7 Summary of Analytical Results of Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 7d | | | | 8d | | | | 9d | | | | 10d | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | ND | ND | ND |
| 2-Methylphenol | 87 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND | ND | ND |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-Dimethylphenol | 69 | 93 | 78 | 32 | ND | ND | ND | ND | ND | ND | ND | ND | BDL | BDL | 10 | BDL | ND | ND | 10 | ND |
| 1,3-Dichlorobenzene | BDL | BDL | 25 | 21 | BDL | BDL | 13 | BDL | 43 | 76 | 130 | BDL | ND | BDL | ND | ND | BDL | BDL | BDL | BDL |
| 1,4-Dichlorobenzene | 290 | 360 | 470 | 390 | 99 | 120 | 130 | 150 | 380 | 750 | 740 | 290 | ND | ND | ND | ND | 170 | 210 | 270 | 250 |
| 1,2-Dichlorobenzene | ND | 100 | 120 | 83 | ND | BDL | BDL | ND | 410 | 890 | 830 | 300 | ND | BDL | ND | BDL | ND | 49 | 56 | 46 |
| Naphthalene | 470 | 510 | 490 | 380 | 98 | 57 | 44 | 59 | BDL | BDL | 26 | ND | BDL | BDL | 16 | BDL | 33 | 41 | 52 | 28 |
| 2-Methylnaphthalene | BDL | BDL | BDL | 10 | BDL | BDL | BDL | ND | BDL | ND | BDL | ND | BDL | BDL | 23 | 18 | BDL | BDL | BDL | ND |
| Dibenzofuran | ND | ND | ND | BDL | ND | ND | ND | ND | ND | ND | ND | ND | BDL | BDL | BDL | BDL | ND | ND | ND | BDL |
| Acenaphthene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | ND | BDL | BDL | ND | BDL | ND | 25 | 22 | 12 ^b | 20 | BDL | 30 |
| 1,2,4 Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| | 11d | | | | 12d | | | | 14d | | | | 15d | | | |
|------------------------|-----------------|------|------|-----------------|------------------|------|------|------|-----------------|------|------|-----------------|------|------|------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | ND | ND |
| 2-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | 14 | ND | 15 ⁱ |
| 4-Methylphenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 25 | ND | 30 ⁱ |
| 2,4-Dimethylphenol | ND | ND | ND | ND | ND | ND | BDL | BDL | 23 | 33 | 11 | BDL | BDL | 140 | 96 | 92 ⁱ |
| 1,3-Dichlorobenzene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | 11 | BDL | BDL | BDL | BDL | 46 | 45 | 37 |
| 1,4-Dichlorobenzene | 38 | 37 | 41 | 30 | ND | ND | ND | ND | 74 | BDL | BDL | 55 ⁱ | 63 | 640 | 650 | 570 ^a |
| 1,2-Dichlorobenzene | BDL | BDL | BDL | BDL | ND | ND | ND | ND | BDL | BDL | BDL | BDL | 13 | 98 | 100 | 77 |
| Naphthalene | BDL | BDL | 29 | BDL | BDL | BDL | BDL | ND | 67 | 93 | 49 | 49 ⁱ | BDL | 630 | 470 | 630 ^d |
| 2-Methylnaphthalene | BDL | 37 | ND | 26 ⁱ | BDL | ND | BDL | BDL | BDL | 10 | BDL | BDL | 76 | 49 | BDL | 41 |
| Dibenzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | BDL | ND | BDL | ND | BDL | ND | BDL |
| Acenaphthene | 17 ^b | 19 | 17 | 15 ⁱ | BDL ^b | BDL | 11 | BDL | 18 ^b | 18 | 15 | 17 ⁱ | ND | 22 | BDL | 18 |
| 1,2,4 Trichlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

ⁱThe result is estimated below the detection level.

^aCompound was detected in the corresponding blank sample.

ⁱSample was diluted to bring concentration into calibration range.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Samples 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

Table 6.8 Summary of Analytical Results of PCBs in Ground-Water Samples from the Upper Water-Bearing Zone. Monsan Kearny Plant; Kearny, New Jersey.

| | 5s | | | | 6s | | | | 7s | | | | 9S | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | ND | ND | ND | ND | 7.5 | 1.5 | 0.7 | ND | 0.3 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | ND | ND | ND | 0.46 | ND | ND | ND | ND | ND | ND | ND | 0.54 | ND | ND | ND | ND |
| Aroclor 1260 | 0.5 | 1.3 | 6.7 | ND | 1.5 | ND | ND | ND | 3.2 | 2.5 | 10 | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | 0.46 | ND | ND | ND | .7 | ND | ND | ND | ND | ND | ND | ND | 3.6 |
| Total PCBs | 0.5 | 1.3 | 6.7 | 0.92 | 9 | 1.5 | 0.7 | .7 | 3.5 | 2.5 | 10 | 0.54 | ND | ND | ND | 3.6 |

| | 11s | | | | 13s | | | | 15s | | | | 16s | | | |
|--------------|------------------|------|------|------|------------------|------|------|------|------|------|------|------|------------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | 0.6 ¹ | ND | 3 | ND | 0.2 ¹ | ND | ND | ND | ND | 0.8 | ND | ND | 0.1 ¹ | 0.4 | ND | ND |
| Aroclor 1242 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1260 | 0.2 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PCBs | 0.8 ¹ | ND | 3 | ND | 0.2 ¹ | ND | ND | ND | ND | 0.8 | ND | ND | 0.1 ¹ | 0.4 | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Table 6.9 Summary of Analytical Results of PCBs in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6d | | | | 7d | | | | 9d | | | | 10d | | | | 11d | | | | 13d | | | |
|--------------|------------------|------------------|------|------|------------------|------|------|------|------|------|------|------|------------------|------------------|------|------|------------------|------|------|------|------------------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Aroclor 1248 | 0.1 ¹ | 0.2 ¹ | ND | ND | 0.2 ¹ | ND | ND | ND | 1.5 | 1.8 | 2.5 | 2.1 | ND | 0.5 ¹ | ND | ND | 0.2 ¹ | ND | ND | ND | 0.1 ¹ | ND | ND | ND |
| Aroclor 1260 | 0.4 ¹ | ND | ND | ND | 0.1 ¹ | ND | ND | ND | ND | ND | ND | ND | 0.1 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | ND | ND | ND | ND | ND | ND | ND | 0.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PCBs | 0.5 ¹ | 0.2 ¹ | ND | ND | 0.3 ¹ | ND | ND | 0.2 | 1.5 | 1.8 | 2.5 | 2.1 | 0.1 ¹ | 0.5 ¹ | ND | ND | 0.2 ¹ | ND | ND | ND | 0.1 ¹ | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

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Table 6.10. Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | 3s | | | 4s | | | 5s | | | 6s | | | 7s | | | 8s | | |
|----------------|-------|----------------|--------|------|-------|------|------|------|-------|------|------|------|------|--------|--------|------|-------|------|------|------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 2 | 3 | 4 | ND | 0.2 | 0.2 | ND | 0.6 | 0.3 | 9 | 3 | 3 | 6 | 4 | 1 | 0.4 | 0.2 | 1 | 2 | 2 | 3 |
| Arsenic | 0.03 | ND | ND | ND | 10 | 0.04 | 0.02 | 0.02 | 0.01 | 0.03 | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 | 0.04 | 0.05 | 0.04 | ND | ND | ND |
| Barium | 0.04 | 0.03 | 0.05 | 0.03 | ND | ND | ND | ND | ND | 0.2 | 0.1 | 0.1 | 0.1 | 0.06 | 0.03 | ND | ND | ND | ND | ND | 0.02 |
| Calcium | 33 | 23 | 20 | 26 | 33 | 25 | 44 | 38 | 46 | 56 | 45 | 52 | 113 | 42 | 45 | 21 | 22 | 23 | 37 | 49 | 54 |
| Chromium | 0.07 | 0.1 | 0.04 | ND | ND | ND | ND | ND | ND | 0.02 | 0.05 | ND | 0.05 | 0.04 | 0.01 | ND | ND | ND | 0.02 | .03 | 0.03 |
| Copper | ND | 0.02 | 0.03 | ND | ND | ND | ND | ND | ND | 0.08 | 0.03 | 0.03 | 0.04 | 0.04 | 0.02 | ND | ND | ND | 0.01 | 0.01 | ND |
| Iron | 6 | 6 ^b | 13 | 6 | 16 | 11 | 12 | 12 | 11 | 67 | 40 | 44 | 14 | 43 | 41 | 19 | 18 | 19 | 9 | 8 | 19 |
| Lead | ND | 0.02 | 0.03 | ND | 0.005 | ND | ND | 0.02 | 0.009 | 0.2 | 0.04 | 0.04 | 0.05 | 0.05 | 0.02 | ND | ND | 0.02 | ND | 0.02 | 0.04 |
| Magnesium | 9 | 9 | 11 | 6 | 7 | 5.6 | 7 | 6 | 8 | 8 | 6 | 7 | 31 | 12 | 13 | 3 | 3 | 3 | 32 | 44 | 51 |
| Manganese | 0.2 | 0.1 | 0.2 | 0.4 | 0.6 | 0.4 | 0.2 | 0.2 | 0.2 | 0.9 | 0.7 | 0.8 | 0.4 | 0.8 | 0.8 | 0.5 | 0.5 | 0.5 | 0.7 | 0.9 | 1.2 |
| Mercury | .0002 | ND | 0.0003 | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0001 | 0.0003 | ND | 0.001 | ND | ND | ND | ND |
| Potassium | 327 | 348 | 409 | 31 | 52 | 35 | 16 | 17 | 16 | 16 | 18 | 18 | 25 | 14 | 12 | ND | ND | ND | 172 | 211 | 207 |
| Sodium | 1810 | 1940 | 1390 | 11 | 21 | 15 | 20 | 19 | 18 | 38 | 36 | 39 | 474 | 12 | 13.4 | 7 | 8 | 6 | 170 | 232 | 255 |
| Vanadium | 0.07 | 0.1 | 0.09 | ND | ND | ND | ND | ND | ND | 0.03 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 | ND | ND | ND | 0.01 | 0.02 | 0.02 |
| Zinc | 0.03 | 0.05 | 0.05 | ND | 0.03 | ND | 0.02 | 0.03 | ND | 0.02 | 0.07 | 0.09 | 0.09 | 0.09 | 0.04 | 0.2 | 0.05 | ND | 0.05 | 0.04 | 0.06 |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130372

Table 6.10. Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 9s | | | 10s | | | 11s | | | 12s | | | 13s | | | 14s | | | 15s | | | 16s | | |
|----------------|------|------|------|------|------|------|------|------|------|------|-----------------|-------|------|-------|------|------|---------|-------|------|------|------|-------|---------|--------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 0.4 | 0.9 | 2 | 0.3 | 1.5 | 0.4 | 0.5 | 0.8 | 5.7 | .4 | 0.3 | 0.2 | 0.9 | 3 | 1 | 2 | 5 | 1.8 | 4 | 5 | 4 | 3 | 2 | ND |
| Arsenic | ND | 0.02 | 0.04 | 0.02 | 0.02 | 0.01 | ND | ND | .006 | .02 | 0.007 | 0.008 | 0.03 | 0.03 | 0.01 | ND | 0.03 | 0.02 | 0.15 | ND | 0.11 | 0.03 | 0.02 | 0.02 |
| Barium | ND | ND | 0.02 | ND | ND | ND | 0.02 | ND | .03 | .04 | 0.03 | 0.04 | 0.01 | 0.03 | 0.03 | ND | 0.02 | ND | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | ND |
| Calcium | 44 | 37 | 33 | 36 | 35 | 44 | 71 | 20 | 36 | 94 | 84 | 111 | 43 | 39 | 42 | 11 | 13 | 14 | 25 | 36 | 35 | 57 | 60 | ND |
| Chromium | ND | 0.01 | ND | ND | ND | ND | ND | ND | .015 | ND | ND | ND | ND | 0.01 | ND | 0.02 | 0.02 | 0.01 | 0.03 | 0.03 | 0.02 | 0.02 | 0.01 | ND |
| Copper | ND | ND | ND | ND | 0.01 | ND | ND | ND | .022 | ND | ND | ND | ND | ND | ND | 0.01 | 0.02 | ND | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | ND |
| Iron | 6 | 8 | 8 | 9 | 12 | 10 | 30 | 10 | 24 | 33 | 27 ^a | 38 | 35 | 38 | 41 | 5 | 12 | 5.2 | 69 | 124 | 99 | 35 | 33 | ND |
| Lead | ND | 0.03 | 0.04 | ND | 0.01 | 0.01 | ND | 0.02 | ND | ND | ND | ND | ND | 0.007 | ND | ND | 0.02 | 0.008 | ND | ND | 0.01 | ND | 0.03 | 0.05 |
| Magnesium | 10 | 9 | 8 | 6 | 6 | 8 | 3 | 1 | 3 | 4 | 3 | 3.6 | 6 | 6 | 5 | 2 | 3 | 2.5 | 13 | 16 | 14 | 9 | 10 | ND |
| Manganese | 0.2 | 0.1 | 0.1 | 0.3 | 0.3 | 0.3 | 0.8 | 0.2 | 0.5 | 1.5 | 0.9 | 1 | 1 | 1 | 1 | 0.08 | 0.2 | 0.008 | 0.5 | 0.7 | 0.6 | 1.5 | 2 | ND |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00002 | ND | ND | ND | ND | .0009 | 0.00005 | 0.0006 |
| Potassium | 97 | 120 | 106 | 27 | 25 | 21 | 27 | 30 | 20 | 49 | 68 | 66 | 10 | 13 | 10 | 157 | 154 | 124 | 81 | 151 | 155 | 11 | 16 | ND |
| Sodium | 112 | 122 | 107 | 13 | 13 | 14 | 7 | 9 | 9 | 47 | 13 | 12.5 | 14 | 19 | 15 | 116 | 146 | 115 | 66 | 88 | 95 | 15 | 22 | ND |
| Vanadium | 0.03 | 0.02 | ND | ND | ND | ND | ND | ND | 0.03 | ND | ND | ND | .01 | 0.03 | 0.02 | 0.02 | 0.03 | 0.01 | 0.02 | 0.03 | 0.03 | 0 | 0.03 | 0.02 |
| Zinc | 0.02 | 0.03 | 0.03 | 0.03 | 0.02 | 0.2 | 0.02 | 0.02 | 0.07 | .02 | 0.02 | 0.03 | .02 | 0.02 | 0.02 | 0.03 | 0.05 | 0.02 | 0.07 | 0.09 | 0.08 | 0.08 | 0.04 | ND |
| Cyanide, Total | ND | ND | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^aThe result is estimated below the detection level.^bCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130373

Table 6.11 Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Lower Water-Bearing Zone, Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | 6d | | | 7d | | | 8d | | | 9d | | | 10d | | | 11d | | |
|----------------|------|------|------|-------|----------------|------|------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|-------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 1 | 1 | 0.7 | 2 | 4.5 | 1 | 5 | 3 | 0.5 | 1 | 1 | 0.5 | 1 | 6 | 1.8 | 2 | 9 | 1 | 7 | 2 | 3.2 |
| Antimony | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.02 | 0.06 | ND | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Barium | ND | ND | ND | 0.025 | 0.03 | 0.02 | 0.2 | 0.02 | 0.014 | ND | ND | ND | ND | 0.04 | 0.02 | 0.02 | 0.04 | ND | 0.03 | 0.01 | 0.02 |
| Cadmium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.05 | ND | ND | ND | ND | ND | ND | ND |
| Calcium | 105 | 105 | 103 | 68 | 61 | 49 | 73 | 55 | 57 | 119 | 137 | 144 | 178 | 182 | 115 | 161 | 134 | 92 | 150 | 111 | 113 |
| Chromium | 0.04 | 0.05 | 0.04 | 0.03 | 0.03 | 0.02 | 0.04 | 0.04 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.04 | 0.03 | 0.02 | 0.04 | 0.01 | 0.03 | 0.02 | 0.02 |
| Copper | ND | 0.01 | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 | ND | 2 | 0.03 | ND | 0.01 | ND | ND |
| Iron | 26 | 30 | 28 | 3 | 6 ^b | 2.5 | 12 | 12 ^b | 14 | 13 | 19 | 17 | 2 | 9 | 3 | 99 | 1113 | 4 | 13 | 5 | 9 |
| Lead | ND | ND | ND | ND | 0.009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.07 | 0.03 | ND | ND | ND | ND |
| Magnesium | 327 | 356 | 361 | 40 | 47 | 49 | 99 | 188 | 108 | 186 | 233 | 238 | 165 | 177 | 149 | 114 | 140 | 151 | 195 | 217 | 235 |
| Manganese | 0.6 | 0.7 | 0.7 | 0.09 | 0.1 | 0.1 | 0.3 | 0.3 | 0.3 | 0.7 | 0.8 | 0.7 | 0.1 | 0.3 | 0.2 | ND | 0.2 | 0.2 | 0.4 | 0.4 | 0.5 |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .0009 | ND |
| Potassium | 190 | 185 | 157 | 40 | 41 | 36 | 56 | 55 | 50 | 138 | 131 | 132 | 115 | 108 | 100 | ND | 114 | 112 | 198 | 195 | 153 |
| Silver | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | 1210 | 1300 | 1390 | 700 | 790 | 720 | 1000 | 1090 | 1160 | 867 | 799 | 847 | 1070 | 1070 | 944 | 787 | 845 | 743 | 1030 | 1080 | 1050 |
| Vanadium | ND | 0.01 | 0.02 | 0.07 | 0.06 | 0.05 | 0.06 | 0.06 | 0.05 | 0.02 | 0.01 | 0.01 | 0.04 | 0.07 | 0.08 | 0.03 | 0.05 | 0.03 | 0.02 | 0.02 | 0.3 |
| Zinc | ND | ND | ND | 0.02 | 0.03 | ND | 0.03 | 0.01 | 0.02 | 0.04 | 0.07 | ND | 0.02 | 0.04 | ND | 0.01 | 0.05 | 0.02 | 0.03 | ND | ND |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^aThe result is estimated below the detection level.^bCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130374

Table 6.11 Summary of Analytical Results of Inorganic Parameters in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 12d | | | 13d | | | 14d | | | 15d | | |
|----------------|------|------|-------|------|------|------|------|-----------------|------|------|-----------------|------|
| | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 | GW-1 | GW-2 | GW-3 |
| Aluminum | 0.8 | 2 | 4 | 8 | 6 | 9 | 6 | 9 | 3 | 4 | 2 | 4 |
| Antimony | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Arsenic | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | 0.1 | ND | ND |
| Barium | 0.01 | 0.01 | 0.02 | 0.05 | 0.01 | 0.07 | ND | 0.04 | ND | 0.02 | 0.02 | 0.02 |
| Cadmium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Calcium | 184 | 111 | 119 | 68 | 134 | 69 | 94 | 89 | 100 | 79 | 141 | 123 |
| Chromium | 0.02 | 0.03 | 0.03 | 0.04 | 0.03 | 0.04 | 0.05 | 0.04 | 0.03 | 0.03 | 0.05 | 0.05 |
| Copper | ND | ND | ND | 0.01 | 0.02 | 0.02 | ND | 0.01 | ND | 0.02 | ND | ND |
| Iron | 3 | 7 | 12.5 | 15 | 10 | 18 | 7 | 11 | 5.6 | 16 | 29 | 28 |
| Lead | ND | ND | 0.006 | ND | ND | 0.02 | ND | ND | ND | ND | ND | ND |
| Magnesium | 199 | 269 | 287 | 90 | 128 | 133 | 208 | 210 | 211 | 146 | 318 | 328 |
| Manganese | 0.1 | 0.3 | 0.4 | 0.5 | 0.3 | 0.5 | 0.6 | 0.6 | 0.55 | 0.6 | 0.9 | 0.8 |
| Mercury | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Potassium | 157 | 179 | 181 | 73 | 88 | 87 | 278 | 26 ^f | 250 | 93 | 16 ^f | 153 |
| Silver | 0.05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sodium | 1020 | 1140 | 1180 | 799 | 1320 | 1420 | 1120 | 1080 | 1140 | 563 | 1270 | 1280 |
| Vanadium | 0.03 | 0.03 | 0.05 | 0.2 | 0.1 | 0.1 | 0.04 | 0.05 | 0.04 | 0.02 | 0.02 | 0.03 |
| Zinc | 0.02 | 0.02 | 0.05 | 0.06 | 0.04 | 0.06 | 0.03 | 0.05 | 0.03 | 0.06 | 0.02 | 0.02 |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

^fThe result is estimated below the detection level.

^aCompound was detected in the corresponding blank sample.

Results are reported in milligrams per liter (mg/l) or parts per million (ppm).

850130375

Table 6.12. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | | 3s | | | | 4s | | | | 5s | | | |
|---------------------------------------|-------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | 11' | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 6' | ND | ND | ND | 73' | ND | ND | 94' |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12' | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12' |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120' | ND | ND | ND | 72' | ND |
| C-9 C-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11' | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11' |
| 1-methyl Ethyl benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 28' | ND | ND | ND | 93' | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | ND | ND | ND | ND | ND | ND | ND | 38' | ND | ND | ND | 19' | 16' | ND | 6' |
| Total Volatile TICs | ND | ND | ND | ND | 11' | ND | ND | ND | 44' | 28' | 120' | 11' | 104' | 109' | 72' | 123' |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

'Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram ($\mu\text{g}/\text{kg}$) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table 6.12. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6s | | | | 7s | | | | 8s | | | | 9s | | | |
|---------------------------------------|----------------|-------------------|------|-----------------|------------------|------------------|------------------|------------------|------|------|------|------|------------------|-----------------|-----------------|------------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | 11 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | ND | ND | ND | ND | 7 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | 8 ¹ | ND | ND | 140 ¹ | ND | ND | 130 ¹ | ND | ND | ND | ND | 85 ¹ | 26 ¹ | ND | 130 ¹ |
| C-4 Benzene | ND | ND | ND | ND | 5 ¹ | ND | ND | 8 ¹ | ND | ND | ND | ND | 86 ¹ | 11 ¹ | ND | 49 ¹ |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7 ¹ | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9 ¹ |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 230 ¹ | ND | ND | ND | ND | ND | ND | ND | 43 ¹ | ND |
| C-10 H-8 Isomer | ND | ND | ND | 12 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethyl benzene | ND | ND | ND | ND | ND | 180 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | 24 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 21 ¹ | ND | ND | 7 ¹ |
| 1,1,2 trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | 7 ¹ | 10.3 ¹ | ND | ND | 46 ¹ | 11 ¹ | ND | 6 ¹ | ND | ND | ND | ND | 15 ¹ | ND | ND | 149 ¹ |
| Total Volatile TICs | 7 ¹ | 42.3 ¹ | ND | 12 ¹ | 196 ¹ | 198 ¹ | 230 ¹ | 144 ¹ | ND | ND | ND | ND | 214 ¹ | 37 ¹ | 43 ¹ | 356 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram (µg/kg) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table 6.12. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 10s | | | | 11s | | | | 12s | | | | 13s | | | |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl) Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | 17 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5 ¹ | ND | ND |
| C-3 Benzene | 390 ¹ | ND | ND | 300 ¹ | 1700 ¹ | 1100 ¹ | ND | ND | 160 ¹ | ND | ND | ND | 74 ¹ | ND | ND | 110 ¹ |
| C-4 Benzene | 83 ¹ | ND | ND | 102 ¹ | 53 ¹ | 28 ¹ | ND | ND | 7 ¹ | ND | ND | 8 ¹ | 21 ¹ | ND | ND | 7 ¹ |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6 ¹ | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-9 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | ND | 71 ¹ | ND | ND | ND | 6 ¹ |
| C-9 Hydrocarbon Isomer | ND | ND | 630 ¹ | ND | 36 ¹ | ND | 2400 ¹ | ND | ND | ND | 390 ¹ | ND | ND | ND | 90 ¹ | ND |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 ¹ | ND | ND | ND | ND |
| 1-methyl Ethyl benzene | ND | 430 ¹ | ND | ND | ND | ND | ND | ND | ND | 280 ¹ | ND | 300 ¹ | ND | 64 ¹ | ND | ND |
| 2,3 dihydro 1-H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19 ¹ | ND | ND | ND | 5 ¹ | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 24 ¹ | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 5 ¹ | 153 ¹ | ND | 6 ¹ | 56 ¹ | 56 ¹ | ND | 50 ¹ | 10 ¹ | ND | ND | 29 ¹ | ND | ND | ND | ND |
| Total Volatile TICs | 478¹ | 600¹ | 630¹ | 422¹ | 1845¹ | 1184¹ | 2400¹ | 50¹ | 201¹ | 299¹ | 390¹ | 440¹ | 95¹ | 74¹ | 90¹ | 123¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram (µg/kg) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table 6.12. Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 14s | | | | 15s | | | | 16s | | | |
|---------------------------------------|------------------|------------------|------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|-----------------|
| | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | 540 ¹ | ND | ND | ND | ND | ND | ND |
| 1-methyl-3-(1-methylethyl)Benzene | ND | 19 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,2,3,4 tetramethyl Benzene | ND | 11 ¹ | ND | ND | ND | ND | ND | ND | ND | 9 ¹ | ND | ND |
| C-3 Benzene | 100 ¹ | ND | ND | 58 ¹ | 8 ¹ | ND | ND | 19 ¹ | 7 ¹ | ND | ND | 29 ¹ |
| C-4 Benzene | 32 ¹ | ND | ND | 40 ¹ | ND | ND | ND | ND | 26 ¹ | ND | ND | 8 ¹ |
| C-5 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Ethyl methyl Benzene | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzofuran | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND | ND | ND |
| Benzo [b] thiophene | ND | ND | ND | ND | ND | ND | ND | 33 ¹ | ND | ND | ND | ND |
| C-9 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | 41 ¹ | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | 7 ¹ | ND | ND | ND | ND |
| C-9 H-10 O Isomer | ND | ND | ND | ND | ND | ND | ND | 62 ¹ | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 35 ¹ | ND | ND | ND | 32 ¹ | 7 ¹ |
| C-10 H-8 Isomer | ND | ND | ND | ND | ND | ND | ND | 680 ¹ | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 to C-32 Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-16 Isomer | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| Dimethyl Heptanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10 ¹ |
| 1-methyl Ethyl benzene | ND | 74 ¹ | ND | ND | ND | 35 ¹ | ND | ND | ND | 40 ¹ | ND | ND |
| 2,3 dihyro 1-H-Indene | ND | 7 ¹ | ND | ND | ND | 41 ¹ | ND | ND | ND | 1 ¹ | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethane | ND | ND | ND | 22 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | 50 ¹ | ND | 13 ¹ | 53 ¹ | ND | ND | 6 ¹ | 26 ¹ | 62 | 12 ¹ | 15 ¹ |
| Total Volatile TICs | 132 ¹ | 161 ¹ | 120 ¹ | 149 ¹ | 61 ¹ | 616 ¹ | 35 ¹ | 869 ¹ | 59 ¹ | 111 ¹ | 44 ¹ | 69 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per kilogram (µg/kg) or parts per billion (ppb).

Samples 3s (GW-1) and 10s (GW-2) were identified incorrectly by the laboratory as sample 3d and 10d, respectively.

*Results for dichlorobenzenes and naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

TICs = Tentatively Identified Compounds.

Table 6.13 Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d ¹ | | | | 6d | | | | 7d | | | | 8d | | | |
|---------------------------|-----------------|-------|------|------|------|------|------|-----------------|----------------|-----------------|------|------|----------------|-------|------|-----------------|
| | GW-1 | GW-2* | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethylbenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 7 ¹ | ND | ND | ND | ND | ND | ND | 34 ¹ |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | ND | ND | ND | ND | ND | ND | ND | ND | ND | 23 ¹ | ND | ND | 7 ¹ | ND | ND | ND |
| Total Volatile TICs | ND | ND | ND | ND | ND | ND | ND | 13 ¹ | 7 ¹ | 23 ¹ | ND | ND | 7 ¹ | ND | ND | 34 ¹ |

| | 9d | | | | 10d ¹ | | | | 11d | | | |
|---------------------------|-----------------|------------------|------------------|------------------|------------------|-------|------|-------|------------------|------------------|-----------------|-----------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4* | GW-1* | GW-2* | GW-3 | GW-4 |
| Volatile TICs | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-methyl Ethylbenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 49 ¹ | ND | ND |
| C-3 Benzene | 50 ¹ | 110 ¹ | ND | ND | ND | ND | ND | ND | 141 ¹ | 45 ¹ | ND | 34 ¹ |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | 13 ¹ | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | 158 ¹ | 190 ¹ | ND | ND | ND | ND | 8 ¹ | ND | 18 ¹ | ND |
| methyl Naphthalene Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknowns | 30 ¹ | 9 ¹ | ND | ND | ND | ND | ND | ND | 9 ¹ | 13 ¹ | ND | ND |
| Total Volatile TICs | 80 ¹ | 119 ¹ | 158 ¹ | 190 | ND | ND | ND | ND | 170 ¹ | 120 ¹ | 18 ¹ | 34 |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

*Results for dichlorobenzenes and/or naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatile sample.

¹ Samples 3d (GW-1) and 10d (GW-2) were identified incorrectly by the laboratory as samples 3s and 10s, respectively.

TICs = Tentatively Identified Compounds.

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Table 6.13 Summary of Analytical Results of Non-Target Volatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 12d | | | | 13d | | | | 14d | | | | 15d | | | |
|---------------------------------------|-----------------------|-----------|-----------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|-----------------------|-----------|------------------------|-----------|-----------|-----------|-----------|
| | GW-1 | GW-2 | GW-3 | GW-4* | GW-1* | GW-2 | GW-3 | GW-4 | GW-1* | GW-2* | GW-3 | GW-4* | GW-1 | GW-2* | GW-3 | GW-4* |
| Volatile TICs | | | | | | | | | | | | | | | | |
| Azulene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 62 ¹ | ND | ND | ND | ND | ND | ND |
| 1-methyl ethyl Benzene | ND | ND | ND | ND | ND | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | 82 ¹ | ND | ND | 31 | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 Hydrocarbon Isomer | ND | ND | ND | ND | ND | ND | 46 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene Isomer | 18 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1,2 Trichloro-1,2,2-trifluoroethene | ND | ND | ND | ND | ND | ND | ND | 15 ¹ | ND | ND | ND | 120 ¹ | ND | ND | ND | ND |
| Unknowns | 38 ¹ | ND | ND | ND | 6 ¹ | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND |
| Total Volatile TICs | 56¹ | ND | ND | ND | 88¹ | 38¹ | 46¹ | 58¹ | ND | 70¹ | ND | 125¹ | ND | ND | ND | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

GW-4 = Ground-water sampling event number 4, March 1990.

ND = Not detected.

¹Concentrations are estimated and compounds are tentatively identified.

Results are reported in microgram per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

*Results for dichlorobenzenes and/or naphthalene were eliminated from the table, because they were quantitated in the corresponding semivolatiles sample.

¹ Samples 3d (GW-1) and 10d (GW-2) were identified incorrectly by the laboratory as samples 3s and 10s, respectively.

TICs = Tentatively Identified Compounds.

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Table 6.14. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 1s | | | | 3s | | | | 4s | | | | 5s | | | |
|-----------------------------------|----------------|------------------|-----------------|------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|------------------|-------------------|-------------------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 28 ¹ | 37 ¹ | ND | 56 ¹ |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | 29 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | 15 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | 213 ¹ | ND | ND | 2600 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 105 ¹ | 110 ¹ | 189 ¹ | ND | 190 ¹ | 210 ¹ | 150 ¹ | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 24 ¹ | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 ¹ | ND | ND | 350 ¹ | 450 ¹ | ND | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| nonyl Phenols | 7 ¹ | ND | ND | ND | ND | 51 ¹ | 54 ¹ | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | 7 ¹ |
| substituted Phenol | ND | ND | ND | ND | ND | 83 ¹ | ND | 17 ¹ | ND | ND | 24 ¹ | 21 ¹ | ND | 31 ¹ | 404 ¹ | 90 ¹ |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | 39 ^B | 58 ¹ | ND | 13 ¹ | 61 ¹ | ND | ND | ND | 59 ^B | 29 ¹ | ND | 34 ¹ | ND | 66 ¹ | ND |
| Unknown Acid Ester | ND | ND | ND | ND | 27 ¹ | ND | 58 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | ND | 226 ¹ | ND | ND | 574 ¹ | 409 ¹ | 357 ¹ | 444 ¹ | 48 ¹ | 40 ¹ | ND | ND | 298 ¹ | 333 ¹ | 407 ¹ | 538 ¹ |
| Total Semivolatile TICs | 7 ¹ | 493 ¹ | 58 ¹ | ND | 3214 ¹ | 633 ¹ | 469 ¹ | 507 ¹ | 153 ¹ | 227 ¹ | 266 ¹ | 21 ¹ | 900 ¹ | 1061 ¹ | 1027 ¹ | 690 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

^BCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table 6.14. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 6s | | | | 7s | | | | 8s | | | |
|-----------------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | 10 ¹ | 84 ¹ | 69 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | 50 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiophene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | 35 ¹ | 20 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 33 ¹ | 15 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | 22 ¹ | ND | ND | ND | ND | ND |
| 2,3 dihydro Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 78 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | 16 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | 330 ¹ | 430 ¹ | 140 ¹ | 10 ¹ | ND | ND | ND | ND | ND | 7 ¹ | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenol isomer | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| nonyl Phenols | 22 ¹ | 27 ¹ | ND | ND | 16 ¹ | 71 ¹ | ND | 41 ¹ | ND | ND | ND | ND |
| substituted Phenol | 19 ¹ | 17 ¹ | 110 ¹ | ND | ND | 248 ¹ | 158 ¹ | 195 ¹ | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 138 ¹ | 26 ^{BD} | 43 ¹ | ND | ND | 14 ¹ | 29 ¹ | ND | 10 ¹ | 23 ^{BD} | ND | ND |
| Unknown | 98 ¹ | 784 ¹ | 385 ¹ | 32 ¹ | 717 ¹ | 421 ¹ | 412 ¹ | 425 ¹ | 30 ¹ | 31 ¹ | 6 ¹ | ND |
| Total Semivolatile TICs | 388¹ | 1234¹ | 988¹ | 232¹ | 769¹ | 838¹ | 690¹ | 661¹ | 40¹ | 54¹ | 13¹ | ND |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.^{BD}Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table 6.14. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 9s | | | | 10s | | | | 11s | | | | 12s | | | |
|-----------------------------------|-------------------------|-------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | 22 ¹ | 14 ¹ | 42 ¹ | ND | 15 ¹ | 280 ¹ | 42 ¹ | 59 ¹ | ND | ND | ND | ND | ND | 130 ¹ | 94 ¹ | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 210 ¹ |
| C-4 Benzene | ND | ND | ND | 110 ¹ | ND | ND | ND | 24 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | 21 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiopene | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | 5 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 13 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 ¹ |
| 2-(1,1-dimethylethyl) Phenol | 450 ¹ | ND | ND | ND | 30 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 120 ¹ | ND | ND | ND | 1500 ¹ | 2100 ¹ | ND | ND | 210 ¹ | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | 740 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | 18 ¹ | ND | ND | ND | ND | ND | 26 ¹ | ND | 72 ¹ | ND | ND | ND | ND |
| C-4 Phenol | 90 ¹ | 330 ¹ | 360 ¹ | 246 ¹ | ND | 260 ¹ | ND | ND | 261 ¹ | 1200 ¹ | 680 ¹ | 350 ¹ | ND | 1300 ¹ | 1400 ¹ | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 ¹ |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19 ¹ | 1124 ¹ | ND | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | ND | ND | 24 ¹ | ND | 208 ¹ | 181 ¹ | 36 ¹ | ND | ND | 36 ¹ |
| substituted Phenol | ND | ND | 89 ¹ | 83 ¹ | ND | 350 ¹ | 1447 ¹ | 2320 ¹ | ND | ND | ND | ND | ND | 558 ¹ | ND | 75 ¹ |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 203 ¹ | 80 ¹ | ND | ND | 27 ¹ | ND | ND | ND | 110 ¹ | 26 ¹ | ND | ND | 203 ¹ | ND | ND | 30 ¹ |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | 529 ¹ | 637 ¹ | 365 ¹ | 91 ¹ | 1287 ¹ | 533 ¹ | 653 ¹ | 332 ¹ | 720 ¹ | 1003 ¹ | 736 ¹ | 362 ¹ | 1000 ¹ | ND | 400 ¹ | 558 ¹ |
| Total Semivolatile TICs | 1414¹ | 1061¹ | 869¹ | 579¹ | 2872¹ | 3523¹ | 2142¹ | 2735¹ | 2065¹ | 2255¹ | 1624¹ | 1207¹ | 2363¹ | 1988¹ | 1894¹ | 710¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table 6.14. Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Upper Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 13s | | | | 14s | | | | 15s | | | | 16s | | | |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|-------------------|-----------------|-------------------|-------------------|-------------------|-------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | | | | | |
| C-x Benzene | ND | 10 ¹ | ND | ND | 12 ¹ | 33 ¹ | ND | ND | ND | ND | 25 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-4 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | 20 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| diBenzo thiopene | ND | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 37 ¹ | 1679 ¹ | 368 ¹ | ND | ND | ND | ND | ND |
| C-x H-x N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | 17 ¹ | 20 ¹ | 11 ¹ | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 322 ¹ | 26 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorophosphate Ethanol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloro 1,1 Biphenyl | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | 15 ¹ | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 630 ¹ | 170 ¹ | 26 ¹ | ND | ND | ND | ND |
| 1-Methyl naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | 29 ¹ | 7 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | 77 ¹ | 60 ¹ | ND | 65 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 13 ¹ | 2200 ¹ | 390 ¹ | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | ND | ND | ND | 9 ¹ | ND | 2200 ¹ | ND | ND | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | 45 ¹ | ND | ND | ND | ND | 58 ¹ | ND | ND | ND | ND | 650 ¹ | 910 ¹ | ND | ND |
| C-8 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | 90 ¹ | ND | ND | ND | 15 ¹ | ND | ND | ND | ND | ND | ND | ND | 55 ¹ | ND | ND |
| nonyl Phenols | 43 ¹ | 54 ¹ | 27 ¹ | 9 ¹ | 26 ¹ | 14 ¹ | 16 ¹ | 71 ¹ | 7 ¹ | ND | ND | ND | 76 ¹ | 54 ¹ | 54 ¹ | ND |
| substituted Phenol | ND | 8 ¹ | 26 ¹ | 136 ¹ | 23 ¹ | ND | 151 ¹ | 68 ¹ | ND | ND | ND | ND | ND | 79 ¹ | 830 ¹ | 115 ¹ |
| methyl Quinoline isomer | ND | 33 ¹ | ND | ND | ND | 9 ¹ | ND | ND | ND | ND | 110 ¹ | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | 14 ¹ | 30 ¹ | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 14 ¹ | 31 ^{1a} | ND | 6 ¹ | 25 ¹ | 21 ¹ | ND | ND | ND | 28 ¹ | ND | ND | ND | ND | 56 ¹ | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown | 457 ¹ | 332 ¹ | 311 ¹ | 276 ¹ | 102 ¹ | 288 ¹ | 248 ¹ | 229 ¹ | 111 ¹ | 4003 ¹ | 903 ¹ | 57 ¹ | 763 ¹ | 952 ¹ | 953 ¹ | 959 ¹ |
| Total Semivolatile TICs | 865 ¹ | 591 ¹ | 409 ¹ | 427 ¹ | 265 ¹ | 440 ¹ | 453 ¹ | 520 ¹ | 222 ¹ | 10790 ¹ | 1977 ¹ | 93 ¹ | 1489 ¹ | 2050 ¹ | 1893 ¹ | 1074 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

^aCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\ell$) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as sample 3d.

TICs = Tentatively Identified Compounds.

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Table 6.15 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 3d | | | | 6d | | | | 7d | | | |
|-------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|-------------------|------------------|-----------------|-----------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | 47 ¹ | ND | ND | 9 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | 47 ¹ | 24 ¹ | ND | 38 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 85 ¹ | ND | 20 ¹ | ND | 98 ¹ | ND | ND | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | 1600 ¹ | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4 Naphthaledione | ND | 92 ¹ | ND | 28 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | 36 ¹ | 30 ¹ | 9 ¹ | ND | ND | ND | ND | 17 ¹ | 26 ¹ | 14 ¹ | 24 ¹ |
| C-4 Phenol | 103 ¹ | ND | ND | ND | ND | 29 ¹ | ND | ND | ND | ND | 4 ¹ | ND |
| substituted Phenol | ND | ND | ND | 15 ¹ | ND | 38 ¹ | 40 ¹ | ND | ND | 7 ¹ | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | 4 ¹ | ND | ND | ND | ND | ND |
| [4-(1 methyl-1-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | 78 ^{1b} | ND | ND | 63 ¹ | 48 ¹ | 49 ¹ | 8 ¹ | ND | 14 ^{1b} | 19 ¹ | ND |
| Unknown | 153 | 148 ¹ | 120 ¹ | 59 ¹ | 400 ¹ | 137 ¹ | 40 ¹ | 14 ¹ | 43 ¹ | 5 ¹ | 14 ¹ | 5 ¹ |
| Total Semivolatile TICs | 435 ¹ | 378 ¹ | 170 ¹ | 158 ¹ | 561 ¹ | 252 ¹ | 133 ¹ | 22 ¹ | 1660 ¹ | 52 ¹ | 51 ¹ | 38 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

^{1b}Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter ($\mu\text{g}/\text{l}$) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

Table 6.15 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 8d | | | | 9d | | | | 10d | | | |
|-----------------------------------------|------|-----------------|------------------|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | ND | ND | ND | ND | 62 ¹ | 96 ¹ | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | 33 ¹ | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | 20 ¹ | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | 35 ¹ | 73 ¹ | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | ND | 23 ¹ | 4 ¹ | ND | ND | ND | 9 ¹ | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 ¹ |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | ND | ND | ND | ND | 8 ¹ | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 66 ¹ | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 85 ¹ | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1-1,4 Naphthalenedione | ND | ND | 19 ¹ | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | 6 ¹ | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | 51 ¹ | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | ND | ND | ND | 73 ¹ | ND | ND | ND | 180 ¹ | 230 ¹ | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-3 Phenol | ND | ND | ND | ND | 29 ¹ | 31 ¹ | 55 ¹ | 29 ¹ | ND | ND | ND | ND |
| C-4 Phenol | ND | ND | ND | ND | ND | 8 ¹ | 12 ¹ | ND | ND | 70 ¹ | ND | ND |
| substituted Phenol | ND | ND | ND | ND | ND | ND | 14 ¹ | 40 ¹ | ND | 77 ¹ | 338 ¹ | 81 ¹ |
| nonyl Phenols | ND | ND | ND | ND | 47 ¹ | ND | 20 ¹ | 11 ¹ | ND | ND | ND | ND |
| [4-(methyl-1-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 520 ¹ |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | 5 ¹ | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | 32 ¹ | 15 ¹ | ND | ND | ND | 23 ¹ | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | ND | ND | 71 ¹ | ND | 56 ¹ | 47 ¹ | ND | ND | ND | 26 ¹ | ND | ND |
| Unknown | ND | ND | 16 ¹ | ND | 246 ¹ | 208 ¹ | 83 ¹ | 58 ¹ | 108 ¹ | 69 ¹ | 118 ¹ | 138 ¹ |
| Total Semivolatile TICs | ND | 23 ¹ | 110 ¹ | ND | 568 ¹ | 406 ¹ | 362 ¹ | 272 ¹ | 359 ¹ | 507 ¹ | 456 ¹ | 751 ¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.²Compound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table 6.15 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 11d | | | | 12d | | | | 13d | | | |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | | | | | |
| C-x Benzene | ND | 12 ^j | 14 ^j | ND | ND | ND | ND | ND | ND | 24 ^j | 19 ^j | 6 ^j |
| C-3 Benzene | ND | ND | ND | 43 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | 10 ^j | ND | ND | ND | ND | ND | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-x H-x O Isomer | 11 ^j | ND | 11 ^j | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | 5 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 S Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 41 ^j | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-9 N O Isomer | ND | ND | ND | 6 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-12 Isomer | ND | ND | ND | 6 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 O Isomer | ND | ND | ND | 6 ^j | ND | ND | ND | 16 ^j | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-10 Isomer | ND | ND | ND | 6 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| 9 H Carbazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | 27 ^j | ND | ND | ND | ND | ND | ND | ND | ND |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | 8 ^j | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | 28 ^j | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | 18 ^j | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | 39 ^j | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4-Naphthaledione | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | 100 ^j | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | 73 ^j | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | 6 ^j | ND | ND | ND | ND | ND | ND | ND | 14 ^j | ND |
| C-3 Phenol | 60 ^j | ND | ND | 31 ^j | 10 ^j | 9 ^j | 15 ^j | 25 ^j | ND | ND | ND | ND |
| C-4 Phenol | ND | 23 ^j | ND | 6 ^j | ND | 32 ^j | 33 ^j | ND | ND | ND | ND | ND |
| substituted Phenol | ND | 65 ^j | 37 ^j | ND | ND | 123 ^j | 77 ^j | 32 ^j | ND | ND | ND | ND |
| nonyl Phenols | 40 ^j | ND | ND | 6 ^j | ND | ND | 14 ^j | 33 ^j | ND | ND | ND | ND |
| [4-(methyl-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | ND | ND | ND | ND | 41 ^j | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| phenyl Pyridine isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Unknown Amide | 169 ^j | 46 ^{aj} | 33 ^j | ND | 213 ^j | 91 ^j | 7 ^j | ND | ND | 18 ^{aj} | 11 ^j | ND |
| Unknown | 552 ^j | 202 ^j | 59 ^j | 57 ^j | 481 ^j | 243 ^j | 192 ^j | 62 ^j | 59 ^j | 87 ^j | 9 ^j | 8 ^j |
| Total Semivolatile TICs | 763^j | 395^j | 199^j | 199^j | 823^j | 508^j | 338^j | 209^j | 100^j | 129^j | 53^j | 14^j |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

^jThe result is estimated below the detection level.^aCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table 6.15 Summary of Analytical Results of Non-Target Semivolatile Organic Compounds in Ground-Water Samples from the Lower Water-Bearing Zone. Monsanto Kearny Plant; Kearny, New Jersey.

| | 14d | | | | 15d | | | |
|---------------------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|--------------------------|
| | GW-1 | GW-2 | GW-3 | GW-4 | GW-1 | GW-2 | GW-3 | GW-4 |
| Semivolatile TICs | | | | | | | | |
| C-x Benzene | ND | 6 ¹ | ND | ND | ND | ND | ND | ND |
| C-3 Benzene | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo (b) thiopene | ND | ND | ND | ND | 10 ¹ | ND | ND | ND |
| substituted Benzene | ND | ND | ND | 6 ¹ | ND | 17 ¹ | ND | ND |
| C-x H-x Isomer | ND | ND | ND | ND | ND | ND | 37 ¹ | ND |
| C-x H-x NO Isomer | ND | ND | ND | ND | 32 ¹ | ND | ND | ND |
| C-x H-x O Isomer | ND | 142 ¹ | ND | ND | 16 ¹ | ND | ND | ND |
| C-7 H-5 N S Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-8 H-6 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-8 O Isomer | ND | ND | ND | 4 ¹ | ND | ND | ND | 53 ¹ |
| C-9 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-9 H-12 O Isomer | ND | ND | ND | ND | ND | ND | ND | 63 ¹ |
| C-10 H-9 N Isomer | ND | ND | ND | ND | ND | ND | ND | 336 ¹ |
| C-10 H-12 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-10 H-14 Isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-11 H-7 N Isomer | ND | ND | ND | ND | ND | ND | ND | 6 ¹ |
| C-11 H-10 Isomer | ND | ND | ND | ND | ND | ND | ND | 280 ¹ |
| 9 H Carazole | ND | ND | ND | 7 ¹ | ND | ND | ND | ND |
| Chlorobenzene | ND | ND | ND | ND | ND | ND | ND | 100 ¹ |
| cyclo Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND |
| Hydrocarbon | ND | ND | ND | ND | ND | ND | ND | ND |
| substituted Hexanionic acid | ND | ND | ND | ND | 11 ¹ | ND | ND | ND |
| 2,3 dihydro 1H-Indene | ND | ND | ND | ND | ND | ND | ND | ND |
| methyl Naphthalene isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| Substituted Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND |
| 2 hydroxyl-1,4-Naphthaledione | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,8 Naphthalic anhydride | ND | ND | ND | ND | ND | ND | ND | ND |
| 2-(1,1-dimethylethyl) Phenol | ND | ND | ND | ND | ND | ND | ND | ND |
| 3,5 diethyl Phenol | ND | 6 ¹ | ND | ND | ND | ND | ND | ND |
| 4-(1-methyl-1-phenylethyl) Phenol | ND | 17 ¹ | ND | ND | ND | ND | ND | ND |
| bis (1,1 dimethyl) Phenol isomer | ND | ND | ND | ND | ND | ND | ND | ND |
| C-2 Phenol | ND | ND | 5 ¹ | 11 ¹ | ND | ND | 45 ¹ | ND |
| C-3 Phenol | 51 ¹ | ND | ND | 73 ¹ | ND | 8 ¹ | 155 ¹ | 1027 ¹ |
| C-4 Phenol | ND | ND | 61 ¹ | ND | ND | ND | ND | ND |
| substituted Phenol | ND | ND | ND | 13 ¹ | ND | 17 ¹ | ND | ND |
| nonyl Phenols | ND | ND | ND | ND | ND | ND | ND | ND |
| [4-(methyl-phenylethyl) phenoxy] meth | ND | ND | ND | ND | ND | ND | ND | ND |
| dimethyl Phenyl isomer | ND | ND | ND | ND | 15 ¹ | ND | ND | ND |
| 2-phenyl Pyridine | ND | ND | ND | ND | ND | ND | ND | 11 ¹ |
| phenyl Pyridine isomer | ND | 5 ¹ | ND | ND | ND | ND | ND | ND |
| methyl Quinoline isomer | ND | ND | ND | ND | ND | 7 ¹ | 54 ¹ | ND |
| Sulfur, mol. (S8) | ND | ND | ND | ND | ND | ND | ND | ND |
| 4-(4-methyl phenyl)-1H-1,2,3 triazole | ND | 17 ¹ | ND | ND | ND | ND | ND | ND |
| Unknown Acid Ester | ND | ND | 17 ¹ | ND | ND | ND | ND | ND |
| Unknown Amide | 27 ¹ | 17 ND | ND | ND | ND | 17 ND | ND | ND |
| Unknown | 41 ¹ | 117 ¹ | 17 ¹ | 71 ¹ | 1407 ¹ | 131 ¹ | 59 ¹ | 660 ¹ |
| Total Semivolatile TICs | 119¹ | 327¹ | 100¹ | 185¹ | 1491¹ | 271¹ | 374¹ | 2,552¹ |

GW-1 = Ground-water sampling event number 1, June 1990.

GW-2 = Ground-water sampling event number 2, September 1990.

GW-3 = Ground-water sampling event number 3, December 1990.

BDL = Below detection level.

ND = Not detected.

¹The result is estimated below the detection level.

NDCompound was detected in the corresponding blank sample.

Results are reported in micrograms per liter (µg/l) or parts per billion (ppb).

Sample 3d (GW-1) was identified incorrectly by the laboratory as samples 3s.

* Results for chlorobenzene were eliminated from this list because they were identified in the corresponding volatile TCL sample.

TICs = Tentatively Identified Compounds.

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Table 6.16. Summary of Analytical Results of General Chemistry for Ground-Water Samples Monsanto Kearny Plant. Kearny, New Jersey.

| General Chemistry(1) | Well Identification Number | | | | | | | | Blank
P1-FB3 | Detection
Limits |
|-----------------------------------------------|----------------------------|-------|------|------|-----|-------|-------|------|-----------------|---------------------|
| | 09S | 09D | 10S | 10D | 11S | 11D | 12S | 12D | | |
| Alkalinity, Total as CaCO ₃ at pH4 | 379 | 41080 | 130 | 963 | 227 | 41120 | 354 | 963 | ND | 5 |
| Ammonium | 4040 | 2500 | 421 | 2740 | 934 | 4410 | 637 | 934 | ND | N/A |
| Cyanide, Total | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 |
| Chloride | 47.0 | 1240 | 6.2 | 838 | 6.2 | 1400 | 41.6 | 1340 | ND | 3 |
| Fluoride | 0.19 | 0.35 | 0.2 | ND | ND | 0.16 | 0.11 | 0.14 | ND | 0.1 |
| Ammonia as N | 9.6 | 7.5 | 1.0 | 10.3 | 1.4 | 6.6 | 1.2 | 1.4 | ND | 1 |
| Nitrite as N | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.05 |
| Nitrate as N | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.05 |
| Orthophosphate as P | 34.2 | 149 | 19.1 | 46.3 | 5.4 | 76.8 | 0.027 | 191 | 0.65 | 5 |
| Sulfate | ND | 250 | ND | 374 | ND | 305 | ND | 615 | ND | 250 |
| Total Kjeldahl Nitrogen as N | 11.0 | 10.0 | 1.3 | 13 | 1.7 | 9.9 | 1.9 | 1.8 | ND | 1.0 |
| Total Dissolved Solids | 770 | 4800 | 280 | 3450 | 280 | 4770 | 490 | 5180 | 40 | 10 |
| Total Suspended Solids | 47 | 72 | 47 | 65 | 89 | 348 | 110 | 63 | ND | 1 |
| pH | 6.7 | 6.8 | 6.7 | 6.9 | 6.5 | 6.5 | 6.6 | 6.5 | 3.9 | 0.01 |

(1) All concentrations reported in milligrams per liter (mg/l) or parts per million (ppm), except pH. pH is reported in standard units.

ND = Not detected.

N/A = Not applicable.

Samples were collected June 13, 1990.

Table 7.1. Air Quality Monitoring Results by Organic Vapor Meter¹ during Phase I Well Installation.² Monsanto Kearny Plant. Kearny, New Jersey.

| Well Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Well Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Well Location and Sample Depth Interval | Maximum Concentration (ppm) ³ |
|--------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|
| <u>MW-13S</u>
0 to 11 feet ⁴ | 0 | <u>MW-8D</u>
0 to 8 feet | 0.2 | <u>MW-12D</u>
0 to 23 feet | 0 |
| | | 8 to 18 feet | 0 | | |
| <u>MW-14S</u>
0 to 15 feet | 0 | 18 to 20 feet | 2 | <u>MW-13D</u>
0 to 29 feet | 0 |
| | | 20 to 26 feet | 0 | | |
| <u>MW-16S</u> | | <u>MW-9D</u> | | | |
| 0 to 5 feet | 0 | 0 to 2 feet | 242 | <u>MW-14D</u> | |
| 5 to 7 feet | 9 | 2 to 4 feet | 222 | 0 to 21 feet | 0 |
| 7 to 9 feet | 0 | 4 to 6 feet | 56 | | |
| 9 to 11 feet | 1 | 6 to 8 feet | 147 | <u>MW-15 S/D</u> | |
| 11 to 13 feet | 0 | 8 to 10 feet | 42 | 0 to 3 feet | 0 |
| | | 10 to 12 feet | 33 | 3 to 5 feet | 1 |
| <u>MW-6D</u> | | 12 to 14 feet | 3 | 5 to 11 feet | 0.2 |
| 0 to 4 feet | 0 | <u>MW-10D</u> | | 11 to 26 feet | 0 |
| 4 to 6 feet | 5 | 0 to 12 feet | 0 | | |
| 6 to 8 feet | 16 | 12 to 16 feet | 2 | | |
| 8 to 10 feet | 3 | 16 to 18 feet | 1 | | |
| 10 to 28 feet | 0 | <u>MW-11D</u> | | | |
| | | 0 to 2 feet | 44 | | |
| <u>MW-7D</u> | | 2 to 4 feet | 587 | | |
| 0 to 2 feet | 0 | 4 to 6 feet | NR ⁵ | | |
| 2 to 4 feet | 10 | 6 to 8 feet | 144 | | |
| 4 to 6 feet | 70 | 8 to 10 feet | 170 | | |
| 6 to 8 feet | 3 | 10 to 14 feet | 0 | | |
| 8 to 10 | 29 | 14 to 17 feet | 0.5 | | |
| 10 to 12 | 8 | 17 to 23 feet | 0.7 | | |

¹OVM = Organic Vapor Meter

²Monitoring occurred between April 30, 1990 and May 17, 1990.

³ppm = parts per million

⁴0 - 11 feet- samples were collected at 2 foot intervals. Where results are the same for consecutive intervals, they are grouped.

⁵NR = No Recovery of soil; therefore, no vapor reading.

Table 7.2. Air Quality Monitoring Results by Organic Vapor Meter¹ during Phase I Soil Boring Drilling.² Monsanto Kearny Plant. Kearny, New Jersey.

| Soil Boring Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Soil Boring Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Soil Boring Location and Sample Depth Interval | Maximum Concentration (ppm) ³ |
|------------------------------------------------|------------------------------------------|------------------------------------------------|------------------------------------------|------------------------------------------------|------------------------------------------|
| <u>AS-1</u> | | <u>TSP-1</u> | | <u>APS-2</u> | |
| 0 to 6 feet ⁴ | 0.0 | 0 to 4 feet | 0.0 | 0 to 2 feet | 97 |
| | | 4 to 6 feet | 2 | 2 to 4 feet | 7 |
| | | | | 4 to 6 feet | 19 |
| <u>AS-2</u> | | <u>TSP-2</u> | | <u>APS-3</u> | |
| 0 to 4 feet | 0.0 | 0 to 6 feet | 0.0 | 0 to 2 feet | 398 |
| 4 to 6 feet | 15 | | | 2 to 4 feet | 304 |
| <u>AS-3</u> | | <u>TSP-3</u> | | 4 to 6 feet | 70 |
| 0 to 6 feet | 0.0 | 0 to 4 feet | 0.0 | | |
| | | 4 to 6 feet | 13 | <u>PDA-1</u> | |
| <u>SSP-1</u> | | <u>TSP-4</u> | | 15 to 17 feet | 5 |
| 0 to 2 feet | 0.0 | 0 to 2 feet | 0.0 | 17 to 19 feet | 0.0 |
| 2 to 4 feet | 5 | 2 to 4 feet | 402 | 19 to 21 feet | 2 |
| 4 to 6 feet | 26 | 4 to 6 feet | 58 | 21 to 23 feet | 2 |
| <u>SSP-2</u> | | <u>APS-1</u> | | 23 to 25 feet | 4 |
| 0 to 2 feet | 11 | 0 to 2 feet | 258 | 25 to 27 feet | 2 |
| 2 to 4 feet | 824 | 2 to 4 feet | 36 | 27 to 29 feet | 0.0 |
| 4 to 6 feet | 801 | 4 to 6 feet | 37 | <u>PDA-2</u> | |
| <u>SSP-3</u> | | | | 15 to 29 feet | 0.0 |
| 0 to 2 feet | 128 | | | | |
| 2 to 4 feet | 654 | | | | |
| 4 to 6 feet | 669 | | | | |

¹OVM = Organic Vapor Meter

²Monitoring occurred between May 5, 1990 and May 7, 1990.

³ppm = parts per million

⁴0 - 6 feet- samples were collected at 2 foot intervals. Where results are the same for consecutive intervals, they are grouped.

Table 7.3. Air Quality Monitoring Results by Organic Vapor Meter¹ during Phase I Surface Soil Sampling.² Monsanto Kearny Plant. Kearny, New Jersey.

| Sample Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Sample Location and Sample Depth Interval | Maximum Concentration (ppm) ³ | Sample Location and Sample Depth Interval | Maximum Concentration (ppm) ³ |
|-------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------|
| APS-SS-01 ⁴ | 145 | SSS-SS-01 | 27 | PDA-SS-01 | 0.0 |
| APS-SS-02 | 54 | SSS-SS-02 | 0.0 | PDA-SS-02 | 0.0 |
| ACD-SS-01 | 0.0 | B02-SS-01 | 0.0 | B14-SS-01 | 0.0 |
| ACD-SS-02 | 0.0 | B16-SS-01 | 0.0 | B10-SS-01 | 0.0 |

¹OVM = Organic Vapor Meter

²Monitoring occurred on May 22, 1990.

³ppm = parts per million

⁴Samples were collected 0 to 2 feet below surface.

Table 7.4. Air Quality Monitoring Results by Organic Vapor Meter¹ during Phase II Soil Boring Drilling.² Monsanto Kearny Plant. Kearny, New Jersey.

| Soil Boring and Sample Depth Interval | Maximum Concentration (ppm) ³ | Soil Boring and Sample Depth Interval | Maximum Concentration (ppm) ³ | Soil Boring and Sample Depth Interval | Maximum Concentration (ppm) ³ |
|---------------------------------------|------------------------------------------|---------------------------------------|------------------------------------------|---------------------------------------|------------------------------------------|
| <u>APSS-4</u> | | <u>TSP-5</u> | | <u>SSP-6</u> | |
| 0 to 2 feet | 394 | 0 to 2 feet | 0 | 0 to 2 feet | 110 |
| 2 to 4 feet | 272 | 2 to 4 feet | 124 | 2 to 4 feet | 290 |
| 4 to 6 feet | 21 | 4 to 6 feet | 10 | 4 to 6 feet | 158 |
| 6 to 8 feet | 12 | 6 to 8 feet | 121 | 6 to 8 feet | 12 |
| 8 to 10 feet | 54 | 8 to 10 feet | 51 | 8 to 10 feet | 34 |
| 10 to 12 feet | 13 | 10 to 12 feet | 30 | 10 to 12 feet | 80 |
| <u>APSS-5</u> | | <u>SSP-4</u> | | | |
| 0 to 2 feet | 3 | 0 to 2 feet | 34 | | |
| 2 to 4 feet | 39 | 2 to 4 feet | 224 | | |
| 4 to 6 feet | 29 | 4 to 6 feet | 142 | | |
| 6 to 8 feet | 34 | 6 to 8 feet | 132 | | |
| 8 to 10 feet | 3 | 8 to 10 feet | 106 | | |
| 10 to 12 feet | 3 | 10 to 12 feet | 110 | | |
| <u>APSS-6</u> | | <u>SSP-5</u> | | | |
| 0 to 2 feet | 77 | 0 to 2 feet | 0.0 | | |
| 2 to 4 feet | 67 | 2 to 4 feet | NR | | |
| 4 to 6 feet | NR ⁴ | 4 to 6 feet | 15 | | |
| 6 to 8 feet | 15 | 6 to 8 feet | 44 | | |
| 8 to 10 feet | NR | 8 to 10 feet | 17 | | |
| 10 to 12 feet | 30 | 10 to 12 feet | 12 | | |

¹OVM = Organic Vapor Meter

²Monitoring occurred between April 4, 1991 and April 5, 1991.

³ppm = parts per million

⁴NR = No Recovery of soil; therefore, no vapor reading.

Table 8.1. Summary of PAH Surface Soil Concentrations (mg/kg) Monsanto Kearny Plant, Kearny, NJ

| | Frequency
of Detection | Site Specific
Background Range | Site
Range | Geometric
Mean | Arithmetic
Mean (a) | SD (b) | Mean + 2SD |
|------------------------|---------------------------|-----------------------------------|---------------|-------------------|------------------------|--------|------------|
| Benzo(a)Anthracene | 6 / 18 | 0.66 - 7.2 | 0.3 - 16 | 0.92 | 1.75 | 3.50 | 8.76 |
| Benzo(a)Pyrene | 9 / 18 | 0.66 - 8 | 0.1 - 14 | 0.71 | 1.53 | 3.08 | 7.69 |
| Benzo(b)Fluoranthrene | 11 / 18 | 0.66 - 14 | 0.2 - 30 | 1.18 | 3.11 | 6.73 | 16.58 |
| Benzo(k)Fluoranthrene | 0 / 18 | 0.66 - 0.66 | 0.38 - 0.66 | 0.60 | 0.61 | 0.10 | 0.82 |
| Chrysene | 12 / 18 | 0.66 - 7.4 | 0.2 - 16 | 1.29 | 2.46 | 3.78 | 10.02 |
| Dibenz(a,h)Anthracene | 4 / 18 | 0.66 - 0.66 | 0.1 - 2.7 | 0.58 | 0.69 | 0.51 | 1.72 |
| Indeno(1,2,3-cd)Pyrene | 5 / 18 | 0.3 - 0.7 | 0.1 - 9 | 0.63 | 1.07 | 1.94 | 4.94 |

Notes:

(a) All non-detected samples were assumed to be detected at the detection limit but they were excluded in the count of frequency of detection.

Thus, it is possible to have a detection frequency of "0" and a site range.

(b) Standard deviation

850130395

Table 8.2. Summary of Dodecylphenol and Nonylphenol Surface Soil Concentrations (mg/kg). Monsanto Kearny Plant, Kearny, NJ

| Compound | Frequency of Detection | Site Specific Background Range | Site Range | Geometric Mean | Arithmetic Mean (b) | SD (c) | Mean + 2 SD |
|---------------|------------------------|--------------------------------|------------|----------------|---------------------|--------|-------------|
| Dodecylphenol | 1 / 15 | (a) | 0 - 1.6 | 0.00 | 0.11 | 0.40 | 0.90 |
| Nonylphenol | 4 / 15 | 0 - 1100 | 0 - 2140 | 0.00 | 164 | 534 | 1230 |

Notes:

(a) Dodecylphenol was not detected in any background samples

(b) All non-detected values were assumed to be zero because detection limits are not provided for tentatively identified compounds

(c) Standard deviation

Table 8.3. Summary of PCB Surface Soil Concentrations (mg/kg) Monsanto Kearny Plant, Kearny, NJ

| Compound | Frequency
of Detection | Site Specific
Background Range | Site
Range | Geometric
Mean | Arithmetic
Mean (a) | SD (b) | Mean + 2 SD |
|--------------|---------------------------|-----------------------------------|---------------|-------------------|------------------------|--------|-------------|
| Aroclor 1248 | 12 / 15 | 0.86 - 79 | 0.86 - 2500 | 5.60 | 180 | 621 | 1420 |
| Aroclor 1260 | 11 / 15 | 1.7 - 20 | 0.93 - 340 | 8.93 | 36.9 | 83.7 | 204 |

Notes:

(a) All non-detected values were assumed to be detected at the detection limit

(b) Standard deviation

850130397

Table 8.4. Derivation of a Reference Dose for Aroclor 1248

| Species | Type of Study | Duration (weeks) | Dose Levels Used in Study (mg/kg/day) | Lowest Observable Adverse Effect Level (LOAEL) (mg/kg/day) | Estimated No Observable Effect Level (NOAEL) a (mg/kg/day) | Uncertainty Factor | Reason for Selecting Uncertainty Factor | Study-Based RfD (mg/kg/day) | Reference |
|-----------------------------|----------------------|------------------|---------------------------------------|------------------------------------------------------------|------------------------------------------------------------|--------------------|-----------------------------------------|-----------------------------|------------------------|
| Rat (male Sprague Dawley) | Chronic | 52 | 0, 10 (est.) | 10 | 0.1 | 100 | b | 1.00E-3 | Allen et al. (1976) |
| Monkey | Sub-chronic | 13 | 0, 40 (est.) | 40 | 0.4 | 500 | c | 8.00E-4 | Allen et al. (1973) |
| Monkey | Chronic Reproductive | 78 | 0, 0.08, 0.16 | 0.08 | 0.008 | 50 | d | 1.60E-4 | Barsotti et al. (1976) |
| Monkey | Sub-chronic | 9 | 0, 4.3, 7.4 | 4.3 | 0.043 | 500 | c | 8.60E-5 | Allen et al. (1974) |
| Rat (male Osborne-Mendel) | Sub-chronic | 4 | 0, 0.056, 0.56, 5.6, 56.0 | 0.56 | 0.056 | 1000 | e | 5.60E-5 | Litterst et al. (1972) |
| Geometric Mean of Studies = | | | | | | | | 2.28E-4 | |

Notes:

- (a) Uncertainty factor for converting from the LOAEL to the NOAEL is based on professional judgment and ranges from 10 to 100 depending on the magnitude of response observed.
- (b) Chronic study in rodents using a factor of 10 to account for variations in human sensitivity and a factor of 10 to extrapolate from animals to humans
- (c) Sub-chronic study in non-human primates using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-chronic to chronic and a factor of 5 to extrapolate from non-human primate to humans
- (d) Chronic study in non-human primates using a factor of 10 to account for variations in human sensitivity, and a factor of 5 to extrapolate from non-human primate to human
- (e) Sub-chronic study in rodents using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-chronic to chronic and a factor of 10 to extrapolate from animals to humans

Table 8.5. Derivation of a Reference Dose for Dodecylphenol

| Species | Type of Study | Duration (days) | Dose Levels Used in Study (mg/kg/day) | Lowest Observable Adverse Effect Level (LOAEL) (mg/kg/day) | Estimated No Observable Adverse Effect Level (NOAEL) a (mg/kg/day) | Uncertainty Factor | Reason for Selecting Uncertainty Factor | Study-Based RfD (mg/kg/day) | Reference |
|--------------------------------------|---------------|-----------------|---------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------|--------------------|-----------------------------------------|-----------------------------|----------------------------------------------------------------------|
| Rat (female CD) | Reproduction | 20 | 0, 125, 250, 500, 1000, 2000 | 500 | 50 | 1000 | b | 5.00E-2 | Bio/dynamics, Inc. (1985) |
| Rat (female CD) | Reproduction | 20 | 20, 100, 300, 5 | 300 | 30 | 1000 | b | 3.00E-2 | Bio/dynamics, Inc. (1987) |
| Rat (male and female Sprague-Dawley) | Sub-acute | 28 | 0, 38, 166, 289 | NOEL as reported in study used as NOAEL | 38 | 1000 | c | 3.80E-2 | Monsanto Agricultural Company Environmental Health Laboratory (1988) |
| Mean of Studies = | | | | | | | | 3.93E-2 | |

Notes:

- (a) Uncertainty factor of 10 used for converting from the LOAEL to the NOAEL is based on professional judgment
 (b) Sub-acute study in rodents using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-acute to chronic and a factor of 10 to extrapolate from animals to humans

850130399

Table 8.6. Estimates of Total Benzo(a)Pyrene Equivalents for Polynuclear Aromatic Hydrocarbons (PAHs). Monsanto Kearny Plant, Kearny, NJ

| | Reasonable Exposed Individual | | | Maximum Exposed Individual | | |
|-----------------------------------|-------------------------------------|-----------------------------------------|---------------------|-------------------------------------|-----------------------------------------|---------------------|
| | Potency Relative
to B(a)P
(a) | Concentration
in Soil (mg/kg)
(b) | B(a)P
equivalent | Potency Relative
to B(a)P
(c) | Concentration
in Soil (mg/kg)
(d) | B(a)P
equivalent |
| Benzo(a)Anthracene | 1.34E-2 | 9.20E-1 | 1.23E-2 | 1.45E-1 | 8.76E+0 | 1.27E+0 |
| Benzo(a)Pyrene | 1.00E+0 | 7.10E-1 | 7.10E-1 | 1.00E+0 | 7.69E+0 | 7.69E+0 |
| Benzo(b)Fluoranthrene | 8.00E-2 | 1.18E+0 | 9.44E-2 | 1.40E-1 | 1.66E+1 | 2.32E+0 |
| Benzo(k)Fluoranthrene | 4.44E-3 | 6.00E-1 | 2.66E-3 | 6.60E-2 | 8.20E-1 | 5.41E-2 |
| Chrysene | 1.22E-3 | 1.29E+0 | 1.57E-3 | 4.40E-3 | 1.00E+1 | 4.41E-2 |
| Dibenz(a,h)Anthracene | 6.90E-1 | 5.80E-1 | 4.00E-1 | 1.11E+0 | 1.72E+0 | 1.91E+0 |
| Indeno(1,2,3-cd)Pyrene | 1.71E-2 | 6.30E-1 | 1.08E-2 | 2.32E-1 | 4.94E+0 | 1.15E+0 |
| Total Benzo(a)Pyrene Equivalents: | | | 1.23E+00 | | | 1.44E+01 |

Notes:

- (a) Based on data published by Chu and Chen (1984)
- (b) Soil Concentration is geometric mean from surface soil data
- (c) Based on data published by Clement Associates, Inc. (1988)
- (d) Soil Concentration is the arithmetic mean plus 2 standard deviations from surface soil data

850130400

**Table 8.7. A Comparison of Concentrations of PCBs Present in Surface Soils
at Selected Years Based on Half-Lives of 5 and 40 Years**

| Estimated Soil Concentration Remaining at End of Specified Year (mg/kg) | | | | | |
|-------------------------------------------------------------------------|----|-----------|---------------------------------------------------------------|----|---------|
| Scenario for Reasonable Exposed Individual
PCB Half-life = 5 | | | Scenario for Maximum Exposed Individual
PCB Half-life = 40 | | |
| Aroclor 1248 | | | | | |
| Initial concentration: 5.60E+0 a | | | Initial concentration: 1.42E+3 b | | |
| Years: | 1 | 4.88E+0 | Years: | 1 | 1.40E+3 |
| | 5 | 2.80E+0 | | 5 | 1.30E+3 |
| | 10 | 1.40E+0 | | 10 | 1.19E+3 |
| | 20 | 3.50E-1 c | | 20 | 1.00E+3 |
| | 40 | 2.19E-2 c | | 40 | 7.10E+2 |
| Aroclor 1260 | | | | | |
| Initial concentration: 8.93E+0 a | | | Initial concentration: 2.04E+2 b | | |
| Years: | 1 | 7.77E+0 | Years: | 1 | 2.00E+2 |
| | 5 | 4.47E+0 | | 5 | 1.87E+2 |
| | 10 | 2.23E+0 | | 10 | 1.72E+2 |
| | 20 | 5.58E-1 c | | 20 | 1.44E+2 |
| | 40 | 3.49E-2 c | | 40 | 1.02E+2 |

Notes:

- (a) Initial concentrations are geometric means from surface soil concentrations
- (b) Initial concentrations are the arithmetic means plus 2 standard deviations from surface soil concentrations
- (c) PCB concentrations at 20 and 40 years are not applicable to the 10 year exposure scenario for the REI

Table 8.8. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant - R

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(d) | CPF
(mg/kg/day) ⁻¹
(e) | RfD
(mg/kg/day)
(f) | Estimated
Potential
ILCR
(g) | Estimated
HI
(h) |
|----------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | | | | | |
| Aroclor 1248 | 2.80E+0 | 4.46E-8 | 1.52E-8 | 8.55E-10 | NA | 2.28E-4 | NA | 3.75E-6 |
| Aroclor 1260 | 4.47E+0 | 7.13E-8 | 2.43E-8 | 1.37E-9 | 7.70E+0 | NA | 1.05E-8 | NA |
| Nonylphenol | 0 | 0 | 0 | 0 | NA | 8.00E-3 | NA | 0 |
| Dodecylphenol | 0 | 0 | 0 | 0 | NA | 4.00E-2 | NA | 0 |
| Benzo(a)pyrene equivalents | 1.23E+0 | 5.94E-9 | 6.69E-9 | 1.80E-10 | 1.15E+1 | NA | 2.07E-9 | NA |

Notes:

- (a) Value is the geometric mean from surface soils (CS); for PCBs a 5 year half-life is assumed.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDII) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = $(LDID + LDII) / BW$
 (e) CPF = Cancer Potency Factor. For PAHs, this is the CPF for benzo(a)pyrene.
 (f) RfD = Reference Dose. The values given were developed as stated in text.
 (g) Potential Incremental Lifetime Cancer Risk (ILCR) = $(LDIT \cdot CPF)$; NA means not applicable because compound is a noncarcinogen.
 (h) Estimated Hazard Index (HI) = $(LDIT) / (RfD)$; NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|---------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 20 |
| Soil adherence (mg/cm ²) (A) = 0.2 | Exposure years (years) (EY) = 10 |
| Skin absorption factor for PCBs (AF1) = 3.30E-03 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | PM10 value (ug/m ³) (PM) = 124 |
| Adult body weight (kg) (BW) = 70 | |

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Table 8.9. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant – Maximum Exposed Individual

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(e) | CPF
(mg/kg/day) ⁻¹
(f) | RfD
(mg/kg/day)
(g) | Estimated
Potential
ILCR
(h) | Estimated
HI
(i) |
|---------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | Ingestion
(d) | | | | | |
| Aroclor 1248 | 1.00E+3 | 3.31E-3 | 5.65E-5 | 8.14E-5 | 4.92E-5 | NA | 2.28E-4 | NA | 2.16E-1 |
| Aroclor 1260 | 1.44E+2 | 4.78E-4 | 8.15E-6 | 1.18E-5 | 7.11E-6 | 7.70E+0 | NA | 5.47E-5 | NA |
| Nonylphenol | 1.23E+3 | 4.07E-2 | 6.95E-5 | 1.00E-4 | 5.84E-4 | NA | 8.00E-3 | NA | 7.31E-2 |
| Dodecylphenol | 9.00E-1 | 2.98E-5 | 5.08E-8 | 7.33E-8 | 4.27E-7 | NA | 4.00E-2 | NA | 1.07E-5 |
| Benzo(a)pyrene equivalent | 1.44E+1 | 4.76E-6 | 8.13E-7 | 1.17E-6 | 9.64E-8 | 1.15E+1 | NA | 1.11E-6 | NA |

Notes:

- (a) Value is the mean plus 2 standard deviations from surface soils (CS); for PCBs a 40 year half-life is assumed.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDII) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from Ingestion (LDIG) = $(CS \cdot TSP \cdot CF \cdot RV \cdot HD \cdot PF \cdot GI \cdot DE \cdot EY) / (DY \cdot LT)$
 (e) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = $(LDID + LDII + LDIG) / BW$
 (f) CPF = Cancer Potency Factor. For PAHs, this is based on benz(a)pyrene equivalents; NA means not applicable because compound is noncarcinogen.
 (g) RfD = Reference Dose. The values given were developed as stated in text; NA means not applicable because compound is considered as a carcinogen.
 (h) Potential Incremental Lifetime Cancer Risk (ILCR) = $(LDIT \cdot CPF)$; NA means not applicable because compound is noncarcinogen
 (i) Estimated Hazard Index (HI) = $(LDIT) / (RfD)$; NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|-------------------------------------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion Factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion Factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 137 |
| Soil adherence (mg/cm ²) (A) = 0.5 | Exposure years (years) (EY) = 40 |
| Skin absorption factor for PCBs (AF1) = 1.00E-02 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | Estimated TSP Value from Newark PM10 (ug/m ³) (TSP) = 67.80 |
| Adult body weight (kg) (BW) = 70 | PM10 Value (ug/m ³) (PM) = 47 |
| Gastrointestinal absorption factor (GI) = 1 | |

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Table 8.10. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant -- Construction Scenario

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(e) | CPF
(mg/kg/day) ⁻¹
(f) | RfD
(mg/kg/day)
(g) | Estimated
Potential
ILCR
(h) | Estimated
HI
(i) |
|----------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | Ingestion
(d) | | | | | |
| Aroclor 1248 | 5.60E+0 | 2.68E-7 | 3.89E-7 | 2.00E-8 | 9.67E-9 | NA | 2.28E-4 | NA | 4.24E-5 |
| Aroclor 1260 | 8.93E+0 | 4.27E-7 | 6.20E-7 | 3.18E-8 | 1.54E-8 | 7.70E+0 | NA | 1.19E-7 | NA |
| Nonylphenol | 0 | 0 | 0 | 0 | 0 | NA | 8.00E-3 | NA | 0 |
| Dodecylphenol | 0 | 0 | 0 | 0 | 0 | NA | 4.00E-2 | NA | 0 |
| Benzo(a)pyrene equivalents | 1.23E+0 | 1.78E-8 | 8.54E-8 | 4.39E-9 | 1.54E-9 | 1.15E+1 | NA | 1.77E-8 | NA |

Notes:

- (a) Soil Concentration (CS); soil concentrations are geometric means of the data.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDIH) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from Ingestion (LDIG) = $(CS \cdot TSP \cdot CF \cdot RV \cdot HD \cdot PF \cdot GI \cdot DE \cdot EY) / (DY \cdot LT)$
 (e) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = $(LDID + LDIH + LDIG) / BW$
 (f) CPF = Cancer Potency Factor. For PAHs, this is based on benz(a)pyrene equivalents; NA means not applicable because compound is noncarcinogen.
 (g) RfD = Reference Dose. The values given were developed as stated in text; NA means not applicable because compound is considered as a carcinogen.
 (h) Potential Incremental Lifetime Cancer Risk (ILCR) = $(LDIT \cdot CPF)$; NA means not applicable because compound is noncarcinogen
 (i) Estimated Hazard Index (HI) = $(LDIT) / (RfD)$; NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|-------------------------------------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion Factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion Factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 240 |
| Soil adherence (mg/cm ²) (A) = 0.5 | Exposure years (years) (EY) = 1 |
| Skin absorption factor for PCBs (AF1) = 3.30E-03 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | Estimated TSP Value from Newark PM10 (ug/m ³) (TSP) = 67.80 |
| Adult body weight (kg) (BW) = 70 | PM10 Value (ug/m ³) (PM) = 1320 |
| Gastrointestinal absorption factor (GI) = 1 | |

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Table 9.1. Remedial Objectives for the Monsanto Kearny Plant Based on the REI Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 75000 |
| Aroclor 1260 | 4270 | NA |
| Nonylphenol | NA | 115000 |
| Dodecylphenol | NA | 575000 |
| Benz(a)pyrene equivalents | 5950 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 9.2. Remedial Objectives for the Monsanto Kearny Plant Based on the MEI Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 465 |
| Aroclor 1260 | 26.5 | NA |
| Nonylph. nol | NA | 1690 |
| Dodecylbenol | NA | 8450 |
| Benzo(a)pyrene equivalents | 130 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 9.3. Remedial Objectives for the Monsanto Kearny Plant Based on the Construction Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 13250 |
| Aroclor 1260 | 755 | NA |
| Nonylphenol | NA | 36800 |
| Dodecylphenol | NA | 184000 |
| Benzo(a)pyrene equivalents | 699 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 9.1. Remedial Objectives for the Monsanto Kearny Plant Based on the REI Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 75000 |
| Aroclor 1260 | 4270 | NA |
| Nonylphenol | NA | 115000 |
| Dodecylphenol | NA | 575000 |
| Benzo(a)pyrene equivalents | 5950 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 9.2. Remedial Objectives for the Monsanto Kearny Plant Based on the MEI Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 465 |
| Aroclor 1260 | 26.5 | NA |
| Nonylphenol | NA | 1690 |
| Dodecylphenol | NA | 8450 |
| Benzo(a)pyrene equivalents | 130 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 9.3. Remedial Objectives for the Monsanto Kearny Plant Based on the Construction Exposure Scenario

| Target Levels in mg/kg (ppm) | | |
|------------------------------|------------------|-------------------------|
| Compound | At ILCR of 1E-5: | At Hazard Index of 0.1: |
| Aroclor 1248 | NA | 13250 |
| Aroclor 1260 | 755 | NA |
| Nonylphenol | NA | 36800 |
| Dodecylphenol | NA | 184000 |
| Benzo(a)pyrene equivalents | 699 | NA |

NA means not applicable because ILCR applies only to carcinogens and HI applies only to noncarcinogens.

Table 8.1. Summary of PAH Surface Soil Concentrations (mg/kg) Monsanto Kearny Plant, Kearny, NJ

| | Frequency
of Detection | Site Specific
Background Range | Site
Range | Geometric
Mean | Arithmetic
Mean (a) | SD (b) | Mean + 2SD |
|------------------------|---------------------------|-----------------------------------|---------------|-------------------|------------------------|--------|------------|
| Benzo(a)Anthracene | 6 / 18 | 0.66 - 7.2 | 0.3 - 16 | 0.92 | 1.75 | 3.50 | 8.76 |
| Benzo(a)Pyrene | 9 / 18 | 0.66 - 8 | 0.1 - 14 | 0.71 | 1.53 | 3.08 | 7.69 |
| Benzo(b)Fluoranthrene | 11 / 18 | 0.66 - 14 | 0.2 - 30 | 1.18 | 3.11 | 6.73 | 16.58 |
| Benzo(k)Fluoranthrene | 0 / 18 | 0.66 - 0.66 | 0.38 - 0.66 | 0.60 | 0.61 | 0.10 | 0.82 |
| Chrysene | 12 / 18 | 0.66 - 7.4 | 0.2 - 16 | 1.29 | 2.46 | 3.78 | 10.02 |
| Dibenz(a,h)Anthracene | 4 / 18 | 0.66 - 0.66 | 0.1 - 2.7 | 0.58 | 0.69 | 0.51 | 1.72 |
| Indeno(1,2,3-cd)Pyrene | 5 / 18 | 0.3 - 0.7 | 0.1 - 9 | 0.63 | 1.07 | 1.94 | 4.94 |

Notes:

(a) All non-detected samples were assumed to be detected at the detection limit but they were excluded in the count of frequency of detection.

Thus, it is possible to have a detection frequency of "0" and a site range.

(b) Standard deviation

Table 8.2. Summary of Dodecylphenol and Nonylphenol Surface Soil Concentrations (mg/kg). Monsanto Kearny Plant, Kearny, NJ

| Compound | Frequency
of Detection | Site Specific
Background Range | Site
Range | Geometric
Mean | Arithmetic
Mean (b) | SD (c) | Mean + 2 SD |
|---------------|---------------------------|-----------------------------------|---------------|-------------------|------------------------|--------|-------------|
| Dodecylphenol | 1 / 15 | (a) | 0 - 1.6 | 0.00 | 0.11 | 0.40 | 0.90 |
| Nonylphenol | 4 / 15 | 0 - 1100 | 0 - 2140 | 0.00 | 164 | 534 | 1230 |

Notes:

(a) Dodecylphenol was not detected in any background samples

(b) All non-detected values were assumed to be zero because detection limits are not provided for tentatively identified compounds

(c) Standard deviation

Table 8.3. Summary of PCB Surface Soil Concentrations (mg/kg) Monsanto Kearny Plant, Kearny, NJ

| Compound | Frequency
of Detection | Site Specific
Background Range | Site
Range | Geometric
Mean | Arithmetic
Mean (a) | SD (b) | Mean + 2 SD |
|-----------------|-----------------------------------|-------------------------------------------|-----------------------|---------------------------|--------------------------------|---------------|--------------------|
| Aroclor 1248 | 12 / 15 | 0.86 - 79 | 0.86 - 2500 | 5.60 | 180 | 621 | 1420 |
| Aroclor 1260 | 11 / 15 | 1.7 - 20 | 0.93 - 340 | 8.93 | 36.9 | 83.7 | 204 |

Notes:

(a) All non-detected values were assumed to be detected at the detection limit

(b) Standard deviation

Table 8.4. Derivation of a Reference Dose for Aroclor 1248

| Species | Type of Study | Duration (weeks) | Dose Levels Used in Study (mg/kg/day) | Lowest Observable Adverse Effect Level (LOAEL) (mg/kg/day) | Estimated No Observable Effect Level (NOAEL) a (mg/kg/day) | Uncertainty Factor | Reason for Selecting Uncertainty Factor | Study-Based RfD (mg/kg/day) | Reference |
|-----------------------------|----------------------|------------------|---------------------------------------|------------------------------------------------------------|------------------------------------------------------------|--------------------|-----------------------------------------|-----------------------------|------------------------|
| Rat (male Sprague Dawley) | Chronic | 52 | 0, 10 (est.) | 10 | 0.1 | 100 | b | 1.00E-3 | Allen et al. (1976) |
| Monkey | Sub-chronic | 13 | 0, 40 (est.) | 40 | 0.4 | 500 | c | 8.00E-4 | Allen et al. (1973) |
| Monkey | Chronic Reproductive | 78 | 0, 0.08, 0.16 | 0.08 | 0.008 | 50 | d | 1.60E-4 | Barsotti et al. (1976) |
| Monkey | Sub-chronic | 9 | 0, 4.3, 7.4 | 4.3 | 0.043 | 500 | c | 8.60E-5 | Allen et al. (1974) |
| Rat (male Osborne-Mendel) | Sub-chronic | 4 | 0, 0.056, 0.56, 5.6, 56.0 | 0.56 | 0.056 | 1000 | e | 5.60E-5 | Litterst et al. (1972) |
| Geometric Mean of Studies = | | | | | | | | 2.28E-4 | |

- Notes:
- (a) Uncertainty factor for converting from the LOAEL to the NOAEL is based on professional judgment and ranges from 10 to 100 depending on the magnitude of response observed.
 - (b) Chronic study in rodents using a factor of 10 to account for variations in human sensitivity and a factor of 10 to extrapolate from animals to humans
 - (c) Sub-chronic study in non-human primates using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-chronic to chronic and a factor of 5 to extrapolate from non-human primate to humans
 - (d) Chronic study in non-human primates using a factor of 10 to account for variations in human sensitivity, and a factor of 5 to extrapolate from non-human primate to human
 - (e) Sub-chronic study in rodents using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-chronic to chronic and a factor of 10 to extrapolate from animals to humans

Table 8.5. Derivation of a Reference Dose for Dodecylphenol

| Species | Type of Study | Duration (days) | Dose Levels Used in Study (mg/kg/day) | Lowest Observable Adverse Effect Level (LOAEL) (mg/kg/day) | Estimated No Observable Adverse Effect Level (NOAEL) ^a (mg/kg/day) | Uncertainty Factor | Reason for Selecting Uncertainty Factor | Study-Based RfD (mg/kg/day) | Reference |
|--------------------------------------|---------------|-----------------|---------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------|-----------------------------------------|-----------------------------|----------------------------------------------------------------------|
| Rat (female CD) | Reproduction | 20 | 0, 125, 250, 500, 1000, 2000 | 500 | 50 | 1000 | b | 5.00E-2 | Bio/dynamics, Inc. (1985) |
| Rat (female CD) | Reproduction | 20 | 20, 100, 300, 5 | 300 | 30 | 1000 | b | 3.00E-2 | Bio/dynamics, Inc. (1987) |
| Rat (male and female Sprague-Dawley) | Sub-acute | 28 | 0, 38, 166, 289 | NOEL as reported in study used as NOAEL | 38 | 1000 | c | 3.80E-2 | Monsanto Agricultural Company Environmental Health Laboratory (1988) |
| Mean of Studies = | | | | | | | | 3.93E-2 | |

Notes:

(a) Uncertainty factor of 10 used for converting from the LOAEL to the NOAEL is based on professional judgment

(b) Sub-acute study in rodents using a factor of 10 to account for variations in human sensitivity, a factor of 10 to extrapolate from sub-acute to chronic and a factor of 10 to extrapolate from animals to humans

Table 8.6. Estimates of Total Benzo(a)Pyrene Equivalents for Polynuclear Aromatic Hydrocarbons (PAHs). Monsanto Kearny Plant, Kearny, NJ

| | Reasonable Exposed Individual | | | Maximum Exposed Individual | | |
|-----------------------------------|-------------------------------------|-----------------------------------------|---------------------|-------------------------------------|-----------------------------------------|---------------------|
| | Potency Relative
to B(a)P
(a) | Concentration
in Soil (mg/kg)
(b) | B(a)P
equivalent | Potency Relative
to B(a)P
(c) | Concentration
in Soil (mg/kg)
(d) | B(a)P
equivalent |
| Benzo(a)Anthracene | 1.34E-2 | 9.20E-1 | 1.23E-2 | 1.45E-1 | 8.76E+0 | 1.27E+0 |
| Benzo(a)Pyrene | 1.00E+0 | 7.10E-1 | 7.10E-1 | 1.00E+0 | 7.69E+0 | 7.69E+0 |
| Benzo(b)Fluoranthrene | 8.00E-2 | 1.18E+0 | 9.44E-2 | 1.40E-1 | 1.66E+1 | 2.32E+0 |
| Benzo(k)Fluoranthrene | 4.44E-3 | 6.00E-1 | 2.66E-3 | 6.60E-2 | 8.20E-1 | 5.41E-2 |
| Chrysene | 1.22E-3 | 1.29E+0 | 1.57E-3 | 4.40E-3 | 1.00E+1 | 4.41E-2 |
| Dibenz(a,h)Anthracene | 6.90E-1 | 5.80E-1 | 4.00E-1 | 1.11E+0 | 1.72E+0 | 1.91E+0 |
| Indeno(1,2,3-cd)Pyrene | 1.71E-2 | 6.30E-1 | 1.08E-2 | 2.32E-1 | 4.94E+0 | 1.15E+0 |
| Total Benzo(a)Pyrene Equivalents: | | | 1.23E+00 | | | 1.44E+01 |

Notes:

- (a) Based on data published by Chu and Chen (1984)
- (b) Soil Concentration is geometric mean from surface soil data
- (c) Based on data published by Clement Associates, Inc. (1988)
- (d) Soil Concentration is the arithmetic mean plus 2 standard deviations from surface soil data

**Table 8.7. A Comparison of Concentrations of PCBs Present in Surface Soils
at Selected Years Based on Half-Lives of 5 and 40 Years**

| Estimated Soil Concentration Remaining at End of Specified Year (mg/kg) | | | | | |
|-------------------------------------------------------------------------|----|-----------|---------------------------------------------------------------|----|---------|
| Scenario for Reasonable Exposed Individual
PCB Half-life = 5 | | | Scenario for Maximum Exposed Individual
PCB Half-life = 40 | | |
| Aroclor 1248 | | | | | |
| Initial concentration: 5.60E+0 a | | | Initial concentration: 1.42E+3 b | | |
| Years: | 1 | 4.88E+0 | Years: | 1 | 1.40E+3 |
| | 5 | 2.80E+0 | | 5 | 1.30E+3 |
| | 10 | 1.40E+0 | | 10 | 1.19E+3 |
| | 20 | 3.50E-1 c | | 20 | 1.00E+3 |
| | 40 | 2.19E-2 c | | 40 | 7.10E+2 |
| Aroclor 1260 | | | | | |
| Initial concentration: 8.93E+0 a | | | Initial concentration: 2.04E+2 b | | |
| Years: | 1 | 7.77E+0 | Years: | 1 | 2.00E+2 |
| | 5 | 4.47E+0 | | 5 | 1.87E+2 |
| | 10 | 2.23E+0 | | 10 | 1.72E+2 |
| | 20 | 5.58E-1 c | | 20 | 1.44E+2 |
| | 40 | 3.49E-2 c | | 40 | 1.02E+2 |

Notes:

- (a) Initial concentrations are geometric means from surface soil concentrations
- (b) Initial concentrations are the arithmetic means plus 2 standard deviations from surface soil concentrations
- (c) PCB concentrations at 20 and 40 years are not applicable to the 10 year exposure scenario for the REI

Table 8.8. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant - R

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(d) | CPF
(mg/kg/day) ⁻¹
(e) | RfD
(mg/kg/day)
(f) | Estimated
Potential
ILCR
(g) | Estimated
HI
(h) |
|----------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | | | | | |
| Aroclor 1248 | 2.80E+0 | 4.46E-8 | 1.52E-8 | 8.55E-10 | NA | 2.28E-4 | NA | 3.75E-6 |
| Aroclor 1260 | 4.47E+0 | 7.13E-8 | 2.43E-8 | 1.37E-9 | 7.70E+0 | NA | 1.05E-8 | NA |
| Nonylphenol | 0 | 0 | 0 | 0 | NA | 8.00E-3 | NA | 0 |
| Dodecylphenol | 0 | 0 | 0 | 0 | NA | 4.00E-2 | NA | 0 |
| Benzo(a)pyrene equivalents | 1.23E+0 | 5.94E-9 | 6.69E-9 | 1.80E-10 | 1.15E+1 | NA | 2.07E-9 | NA |

Notes:

- (a) Value is the geometric mean from surface soils (CS); for PCBs a 5 year half-life is assumed.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDII) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = (LDID + LDII) / BW
 (e) CPF = Cancer Potency Factor. For PAHs, this is the CPF for benzo(a)pyrene.
 (f) RfD = Reference Dose. The values given were developed as stated in text.
 (g) Potential Incremental Lifetime Cancer Risk (ILCR) = (LDIT*CPF); NA means not applicable because compound is a noncarcinogen.
 (h) Estimated Hazard Index (HI) = (LDIT)/ (RfD); NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|---------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 20 |
| Soil adherence (mg/cm ²) (A) = 0.2 | Exposure years (years) (EY) = 10 |
| Skin absorption factor for PCBs (AF1) = 3.30E-03 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | PM10 value (ug/m ³) (PM) = 124 |
| Adult body weight (kg) (BW) = 70 | |

Table 8.9. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant – Maximum Exposed Individual

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(e) | CPF
(mg/kg/day) ⁻¹
(f) | RfD
(mg/kg/day)
(g) | Estimated
Potential
ILCR
(h) | Estimated
HI
(i) |
|---------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | Ingestion
(d) | | | | | |
| Aroclor 1248 | 1.00E+3 | 3.31E-3 | 5.65E-5 | 8.14E-5 | 4.92E-5 | NA | 2.28E-4 | NA | 2.16E-1 |
| Aroclor 1260 | 1.44E+2 | 4.78E-4 | 8.15E-6 | 1.18E-5 | 7.11E-6 | 7.70E+0 | NA | 5.47E-5 | NA |
| Nonylphenol | 1.23E+3 | 4.07E-2 | 6.95E-5 | 1.00E-4 | 5.84E-4 | NA | 8.00E-3 | NA | 7.31E-2 |
| Dodecylphenol | 9.00E-1 | 2.98E-5 | 5.08E-8 | 7.33E-8 | 4.27E-7 | NA | 4.00E-2 | NA | 1.07E-5 |
| Benzo(a)pyrene equivalent | 1.44E+1 | 4.76E-6 | 8.13E-7 | 1.17E-6 | 9.64E-8 | 1.15E+1 | NA | 1.11E-6 | NA |

Notes:

- (a) Value is the mean plus 2 standard deviations from surface soils (CS); for PCBs a 40 year half-life is assumed.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDII) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from Ingestion (LDIG) = $(CS \cdot TSP \cdot CF \cdot RV \cdot HD \cdot PF \cdot GI \cdot DE \cdot EY) / (DY \cdot LT)$
 (e) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = $(LDID + LDII + LDIG) / BW$
 (f) CPF = Cancer Potency Factor. For PAHs, this is based on benz(a)pyrene equivalents; NA means not applicable because compound is noncarcinogen.
 (g) RfD = Reference Dose. The values given were developed as stated in text; NA means not applicable because compound is considered as a carcinogen.
 (h) Potential Incremental Lifetime Cancer Risk (ILCR) = $(LDIT \cdot CPF)$; NA means not applicable because compound is noncarcinogen
 (i) Estimated Hazard Index (HI) = $(LDIT) / (RfD)$; NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|-------------------------------------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion Factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion Factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 137 |
| Soil adherence (mg/cm ²) (A) = 0.5 | Exposure years (years) (EY) = 40 |
| Skin absorption factor for PCBs (AF1) = 1.00E-02 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | Estimated TSP Value from Newark PM10 (ug/m ³) (TSP) = 67.80 |
| Adult body weight (kg) (BW) = 70 | PM10 Value (ug/m ³) (PM) = 47 |
| Gastrointestinal absorption factor (GI) = 1 | |

Table 8.10. Estimated Baseline Incremental Lifetime Cancer Risks (ILCR) and Hazard Indices (HI) for Exposure to Chemicals Identified at the Monsanto Kearny Plant – Construction Scenario

| Chemical | Concentration
in Soil
(mg/kg)
(a) | Estimated Lifetime Average
Daily Intake (mg/day) | | | Estimated Lifetime
Average Daily Intake
All Pathways
(mg/kg/day)
(e) | CPF
(mg/kg/day) ⁻¹
(f) | RfD
(mg/kg/day)
(g) | Estimated
Potential
ILCR
(h) | Estimated
HI
(i) |
|----------------------------|--------------------------------------------|-----------------------------------------------------|-------------------|------------------|----------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------------------|------------------------|
| | | Dermal
Absorption
(b) | Inhalation
(c) | Ingestion
(d) | | | | | |
| Aroclor 1248 | 5.60E+0 | 2.68E-7 | 3.89E-7 | 2.00E-8 | 9.67E-9 | NA | 2.28E-4 | NA | 4.24E-5 |
| Aroclor 1260 | 8.93E+0 | 4.27E-7 | 6.20E-7 | 3.18E-8 | 1.54E-8 | 7.70E+0 | NA | 1.19E-7 | NA |
| Nonylphenol | 0 | 0 | 0 | 0 | 0 | NA | 8.00E-3 | NA | 0 |
| Dodecylphenol | 0 | 0 | 0 | 0 | 0 | NA | 4.00E-2 | NA | 0 |
| Benzo(a)pyrene equivalents | 1.23E+0 | 1.78E-8 | 8.54E-8 | 4.39E-9 | 1.54E-9 | 1.15E+1 | NA | 1.77E-8 | NA |

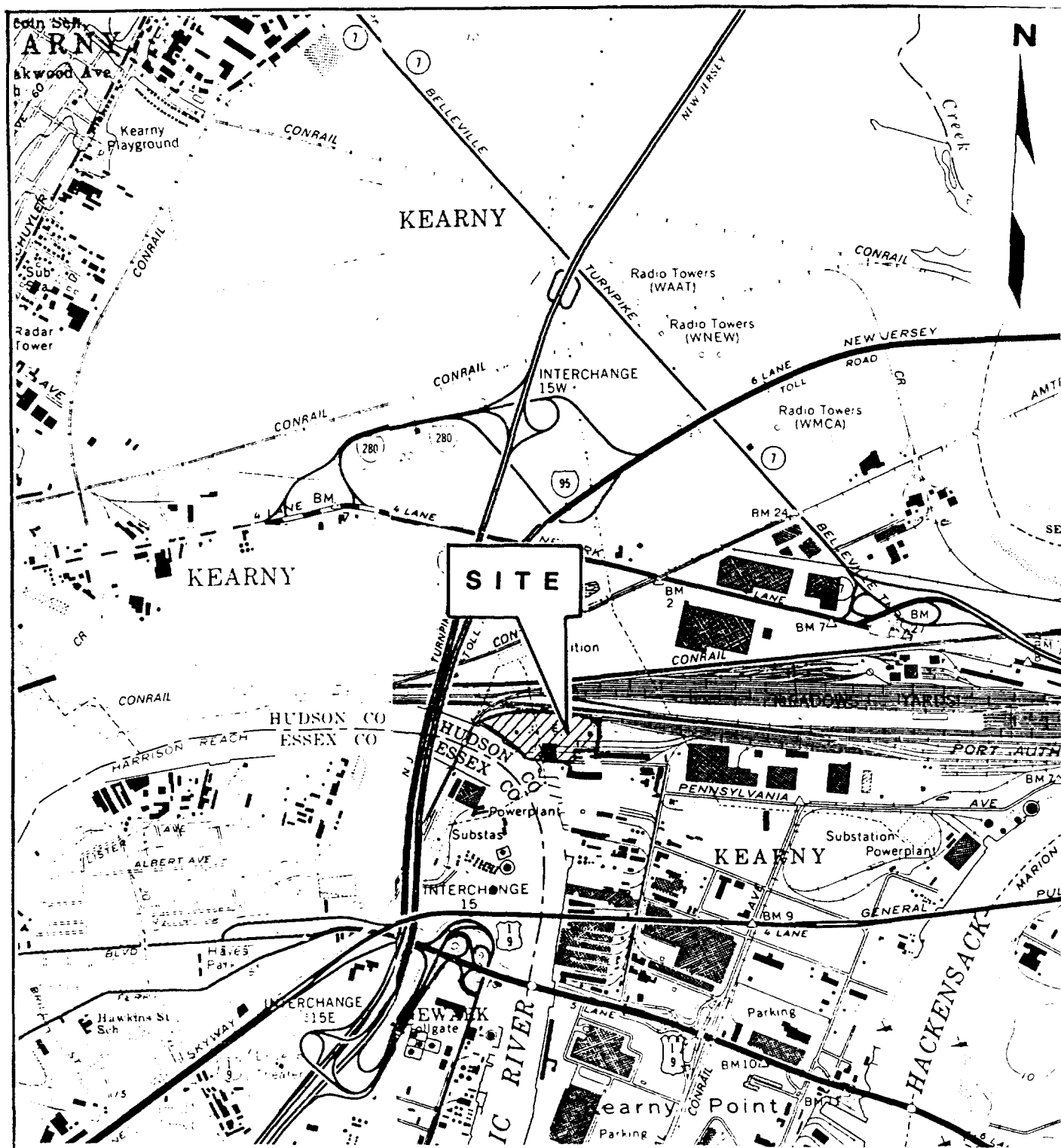
Notes:

- (a) Soil Concentration (CS); soil concentrations are geometric means of the data.
 (b) Estimated Lifetime Average Daily Intake from Dermal Absorption (LDID) = $(CS \cdot SA \cdot PA \cdot A \cdot F \cdot AF \cdot DE \cdot EY) / (DY \cdot LT)$
 (c) Estimated Lifetime Average Daily Intake from Inhalation (LDII) = $(CS \cdot PM \cdot CF \cdot RV \cdot HD \cdot PF \cdot DE \cdot EY) / (DY \cdot LT)$
 (d) Estimated Lifetime Average Daily Intake from Ingestion (LDIG) = $(CS \cdot TSP \cdot CF \cdot RV \cdot HD \cdot PF \cdot GI \cdot DE \cdot EY) / (DY \cdot LT)$
 (e) Estimated Lifetime Average Daily Intake from all Pathways (LDIT) = $(LDID + LDII + LDIG) / BW$
 (f) CPF = Cancer Potency Factor. For PAHs, this is based on benz(a)pyrene equivalents; NA means not applicable because compound is noncarcinogen.
 (g) RfD = Reference Dose. The values given were developed as stated in text; NA means not applicable because compound is considered as a carcinogen.
 (h) Potential Incremental Lifetime Cancer Risk (ILCR) = $(LDIT \cdot CPF)$; NA means not applicable because compound is noncarcinogen
 (i) Estimated Hazard Index (HI) = $(LDIT) / (RfD)$; NA means not applicable because compound is a carcinogen.

Constants:

| | |
|----------------------------------------------------------------|-------------------------------------------------------------------------|
| Respiratory volume (m ³ /hr) (RV) = 1.4 | Conversion Factor (kg/mg) (F) = 1.00E-06 |
| Pulmonary retention factor (PF) = 0.5 | Conversion Factor (kg/ug) (CF) = 1.00E-09 |
| Body surface area (cm ²) (SA) = 18150 | Hours exposed/day (hours/day) (HD) = 8 |
| Percent of SA that is contact area (PA) = 0.17 | Days exposed per year (days/year) (DE) = 240 |
| Soil adherence (mg/cm ²) (A) = 0.5 | Exposure years (years) (EY) = 1 |
| Skin absorption factor for PCBs (AF1) = 3.30E-03 | Total days per year (days/year) (DY) = 365 |
| Skin absorption factor for phenolic compounds (AF2) = 1.00E-01 | Lifetime (years) (LT) = 70 |
| Skin absorption factor for benzo(a)pyrene (AF3) = 1.00E-03 | Estimated TSP Value from Newark PM10 (ug/m ³) (TSP) = 67.80 |
| Adult body weight (kg) (BW) = 70 | PM10 Value (ug/m ³) (PM) = 1320 |
| Gastrointestinal absorption factor (GI) = 1 | |

850130420



SOURCE: U.S.G.S. ORANGE, N.J. QUADRANGLE, 1955
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 U.S.G.S. WEEHAWKEN, N.J. QUADRANGLE, 1967
 U.S.G.S. JERSEY CITY, N.J. QUADRANGLE, 1967
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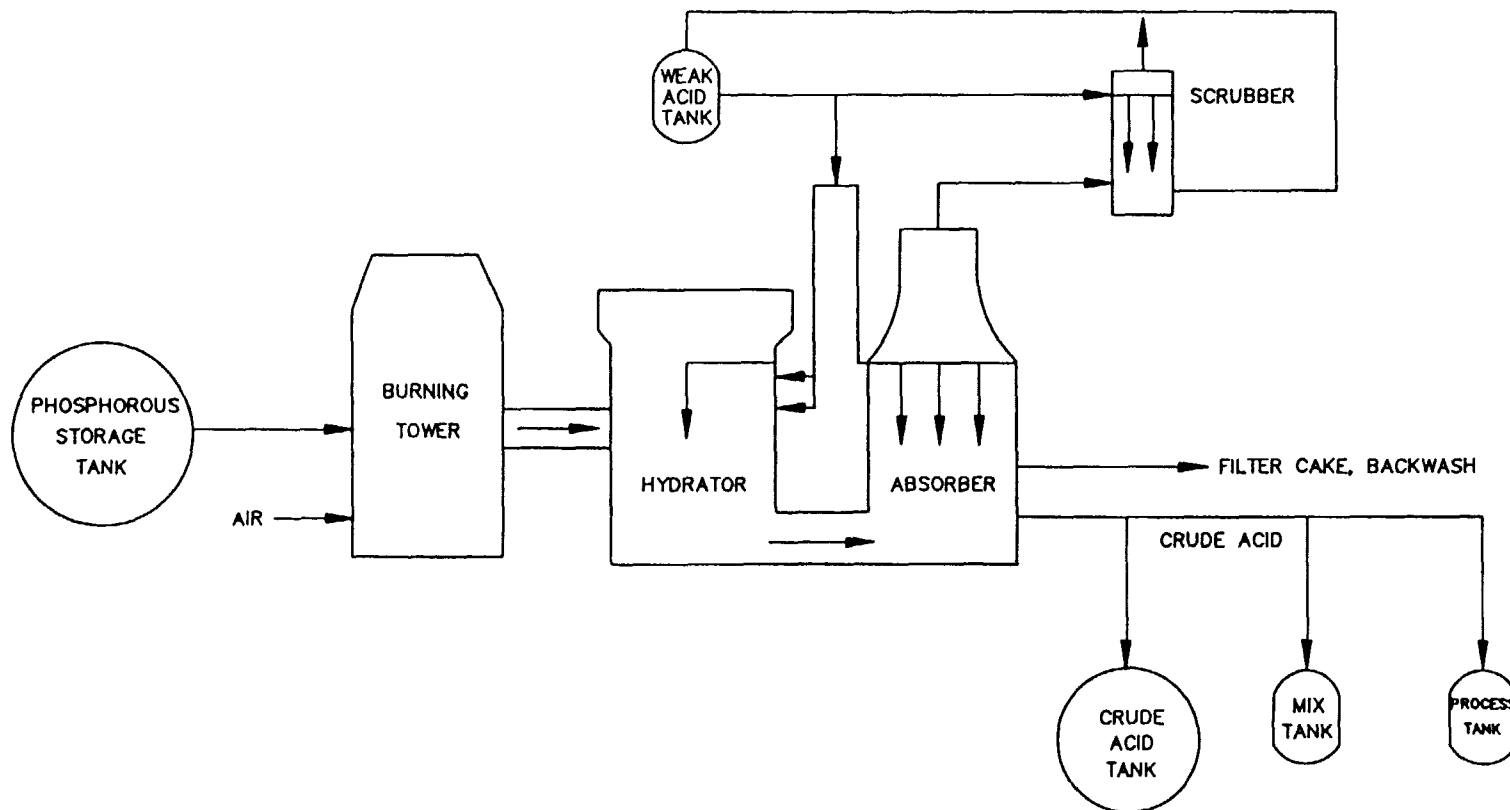
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 KEARNY, NEW JERSEY

Prepared for

MONSANTO COMPANY

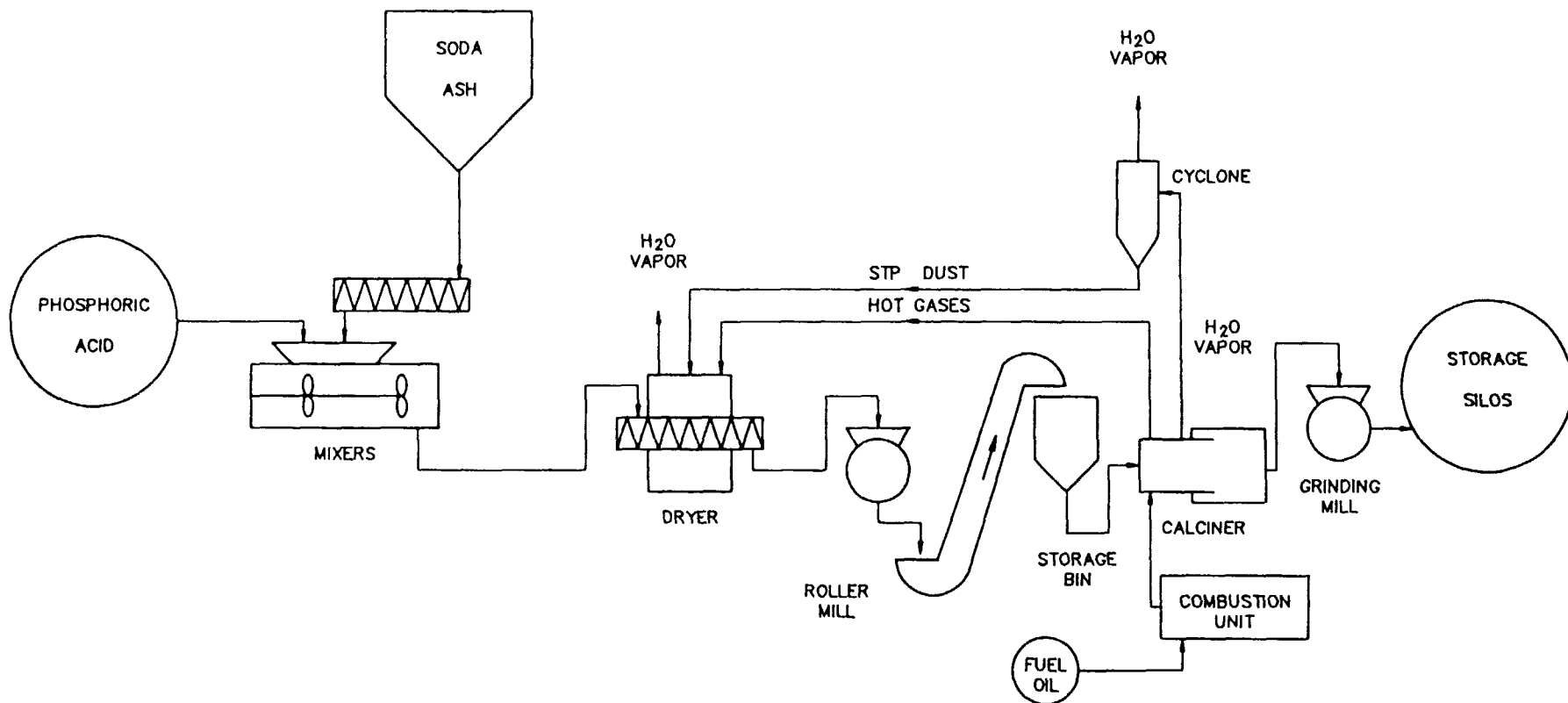
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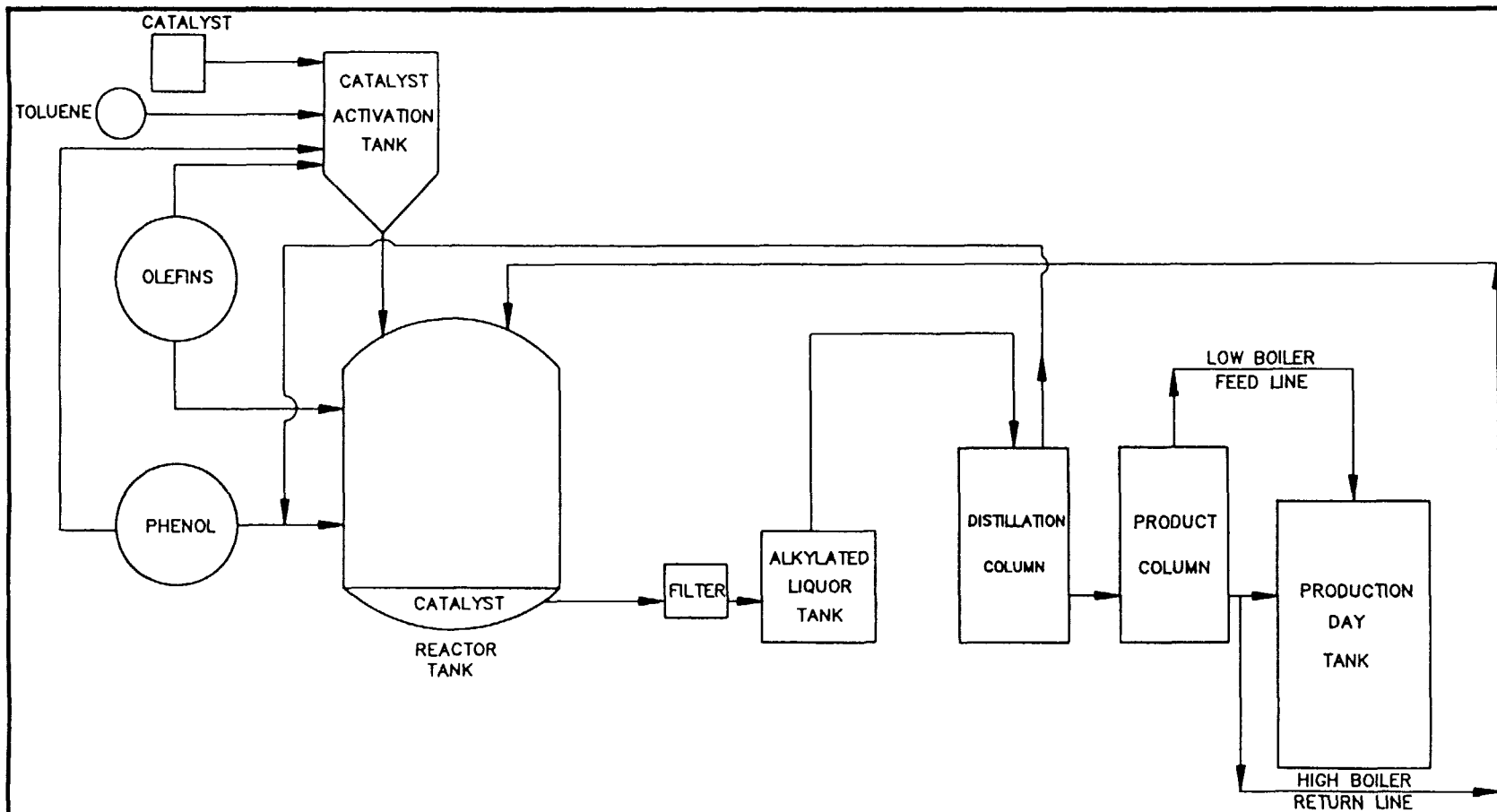
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| Prepared for: | | | |
| MONSANTO COMPANY | | | |
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SODIUM TRIPOLYPHOSPHATE
(STP) | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.P. | Date: 07/91 | Figure
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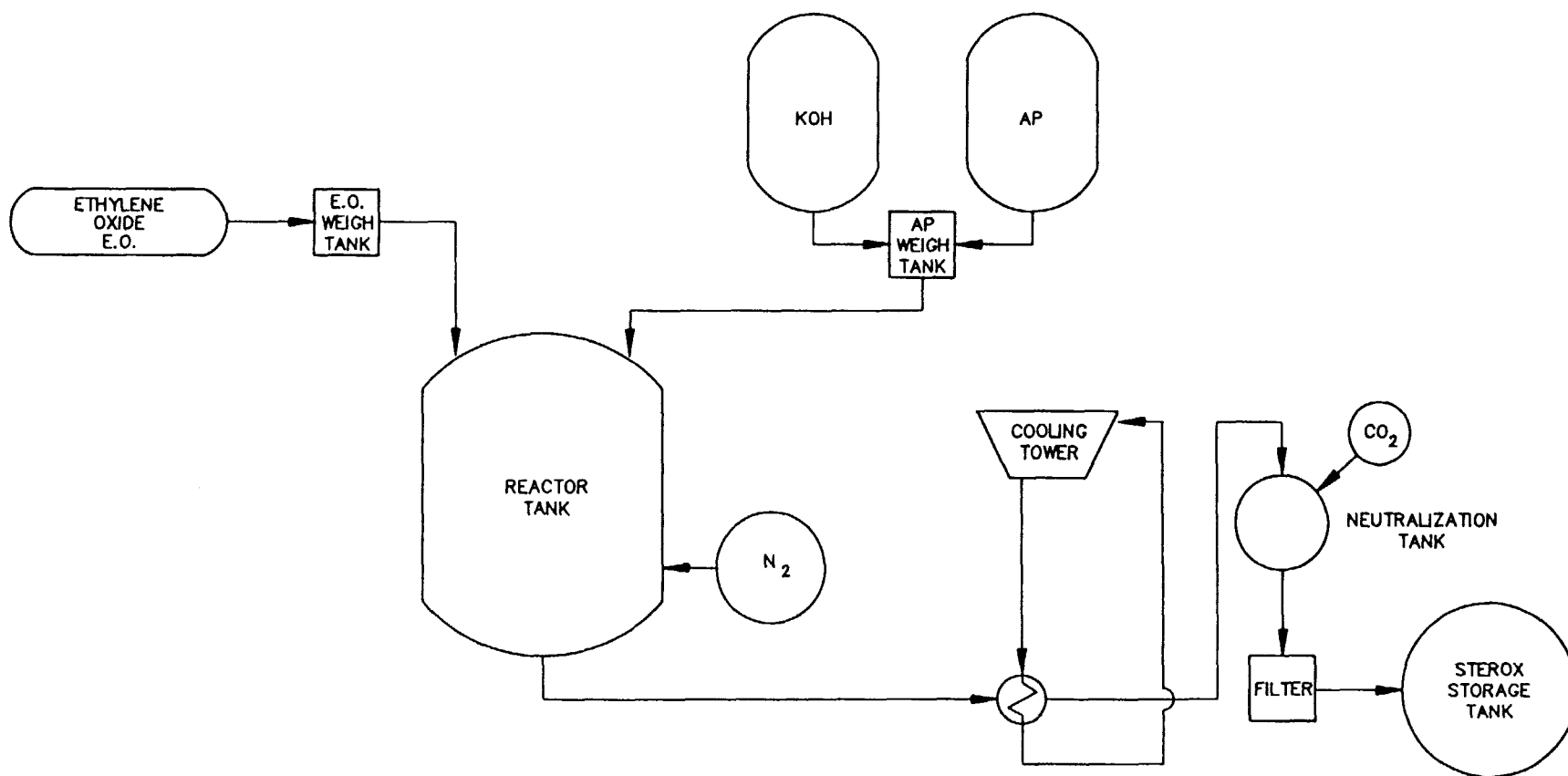
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| KEARNY PLANT | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.P. | Date: 07/91 | Figure
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| | Prepared by: R.W. | Scale: NONE | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A39 | | |

850130425





Title:

GENERAL PROCESS DIAGRAM STEROX

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: J.P.

Date: 07/81

Figure

Prepared by: M.I.V.

Scale: NONE

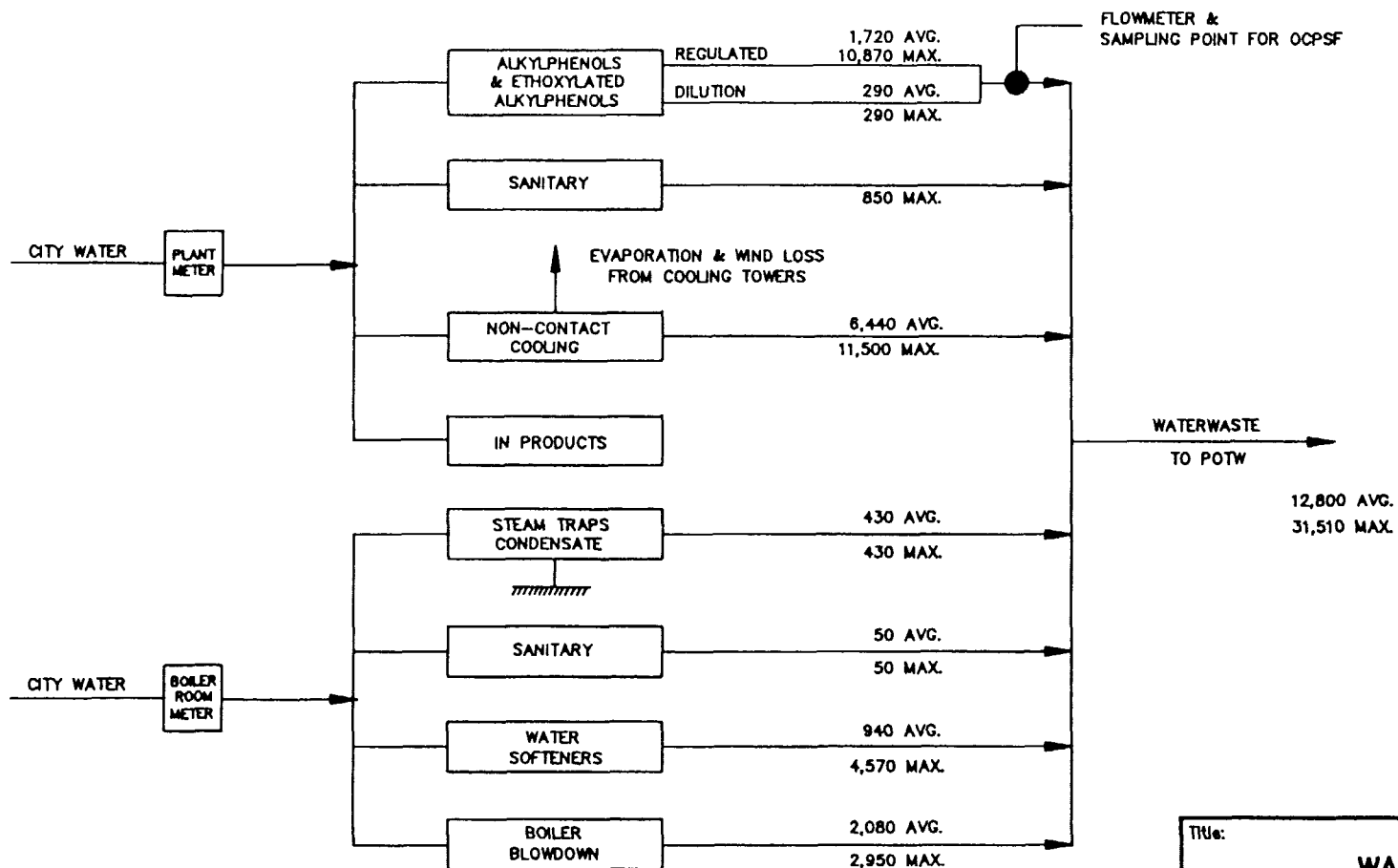
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Revision:

File No. 06606J-A41

3.5

850130427



NOTE :

UNITS IN GALLONS PER DAY (GPD)

Title:

**WATER-WATER
FLOW DIAGRAM**

KEARNY PLANT

Prepared for:

MONSANTO COMPANY

ROUXROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: J.P.

Date: 07/01

Figure

Prepared by: R.W.

Scale: NONE

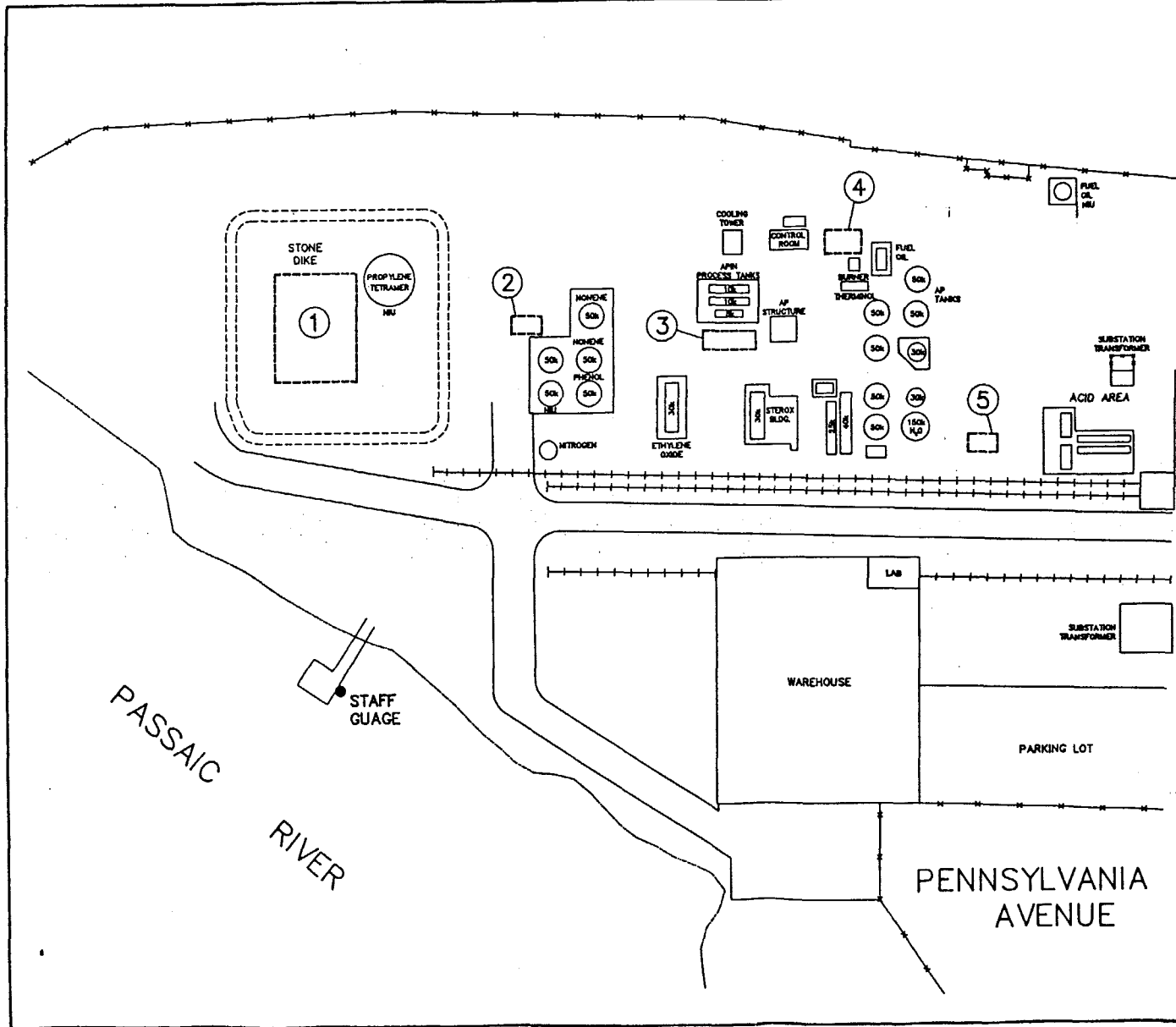
Project Mgr: P.C.B.

Revision:

File No. 06606J-A40

3.6

N



Title:

LOCATION OF
AREAS OF CONCERN

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUXROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: P.C.B. Date: 07/91

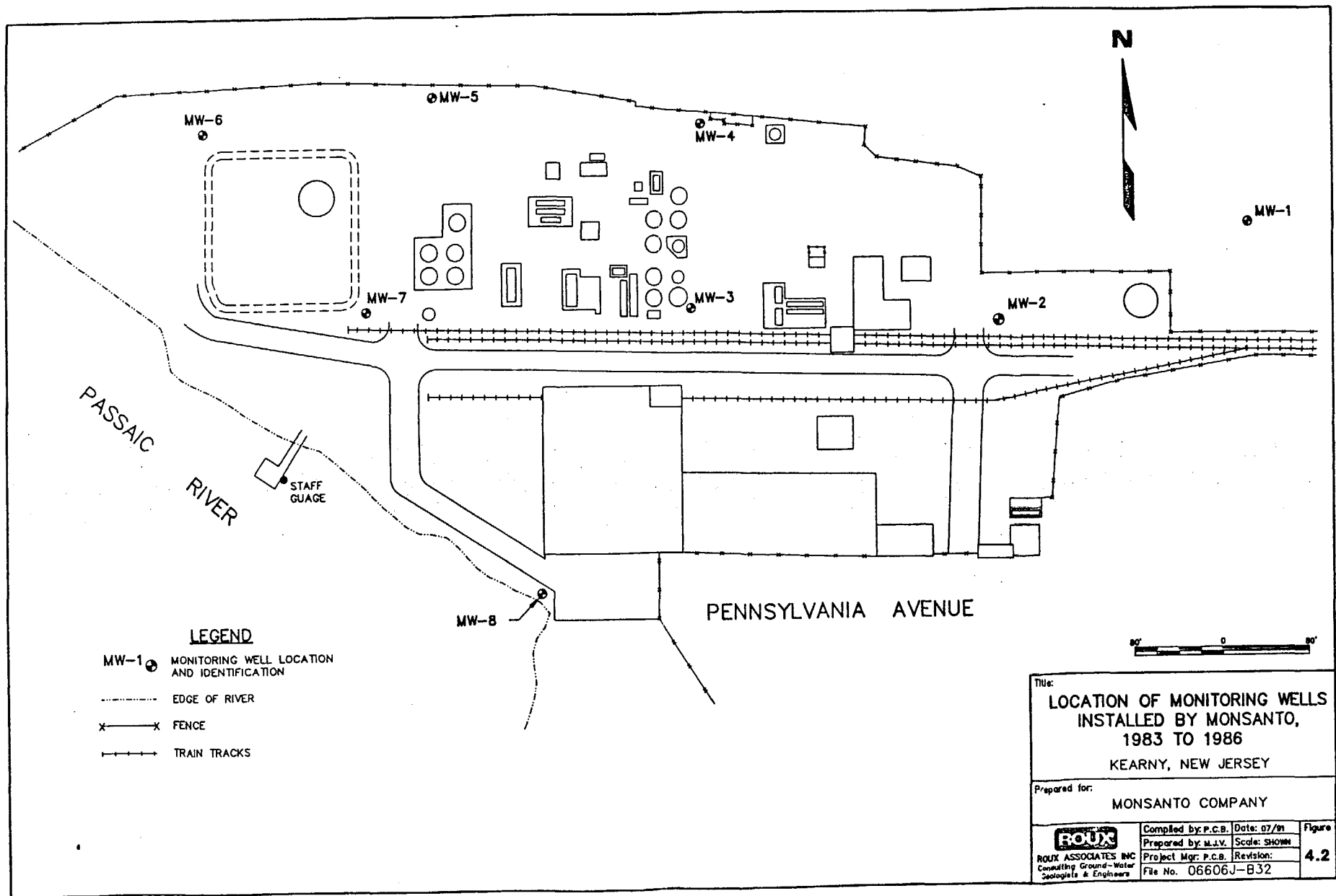
Prepared by: R.W. Scale: SHOWN

Project Mgr: P.C.B. Revision:

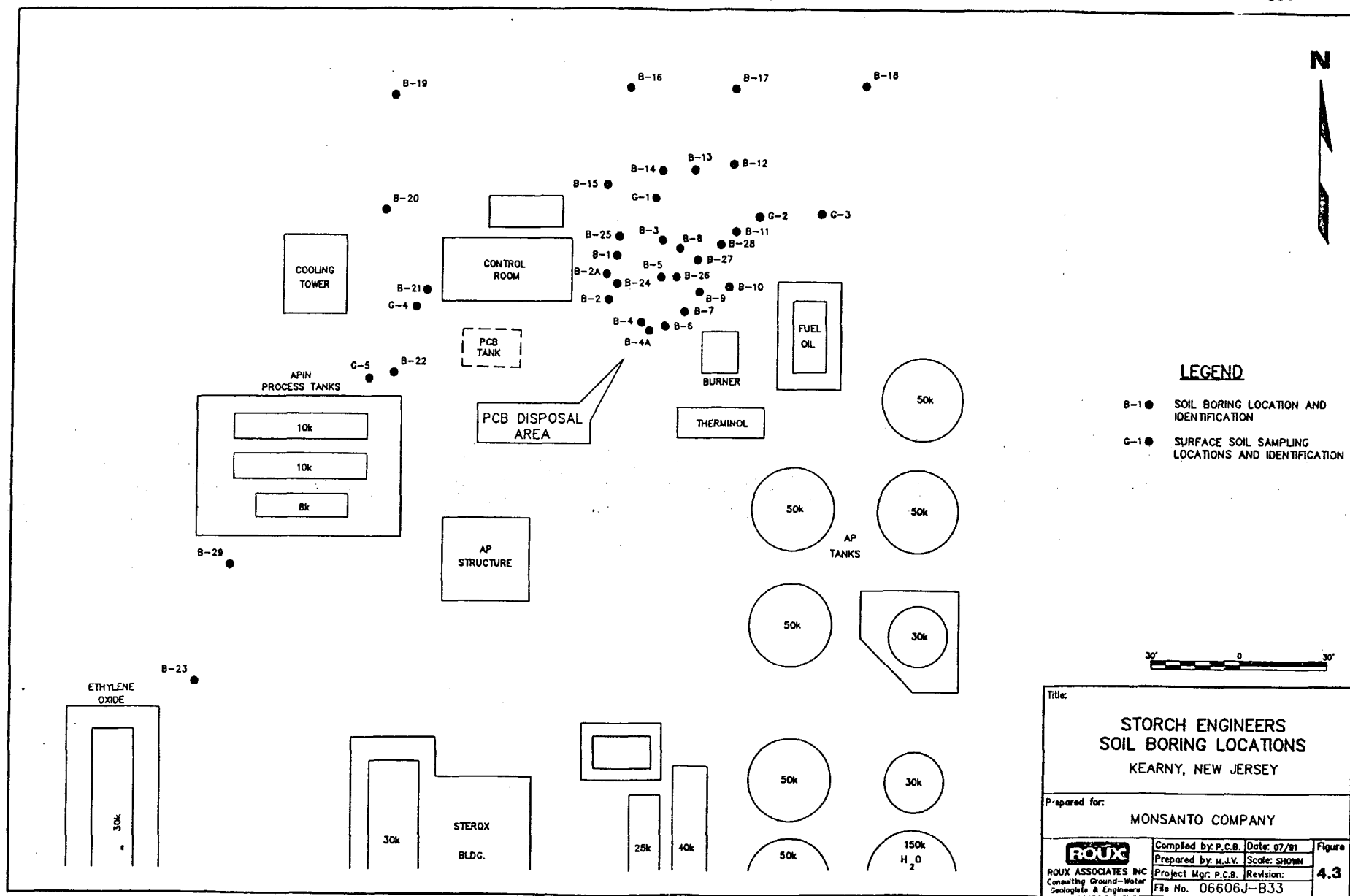
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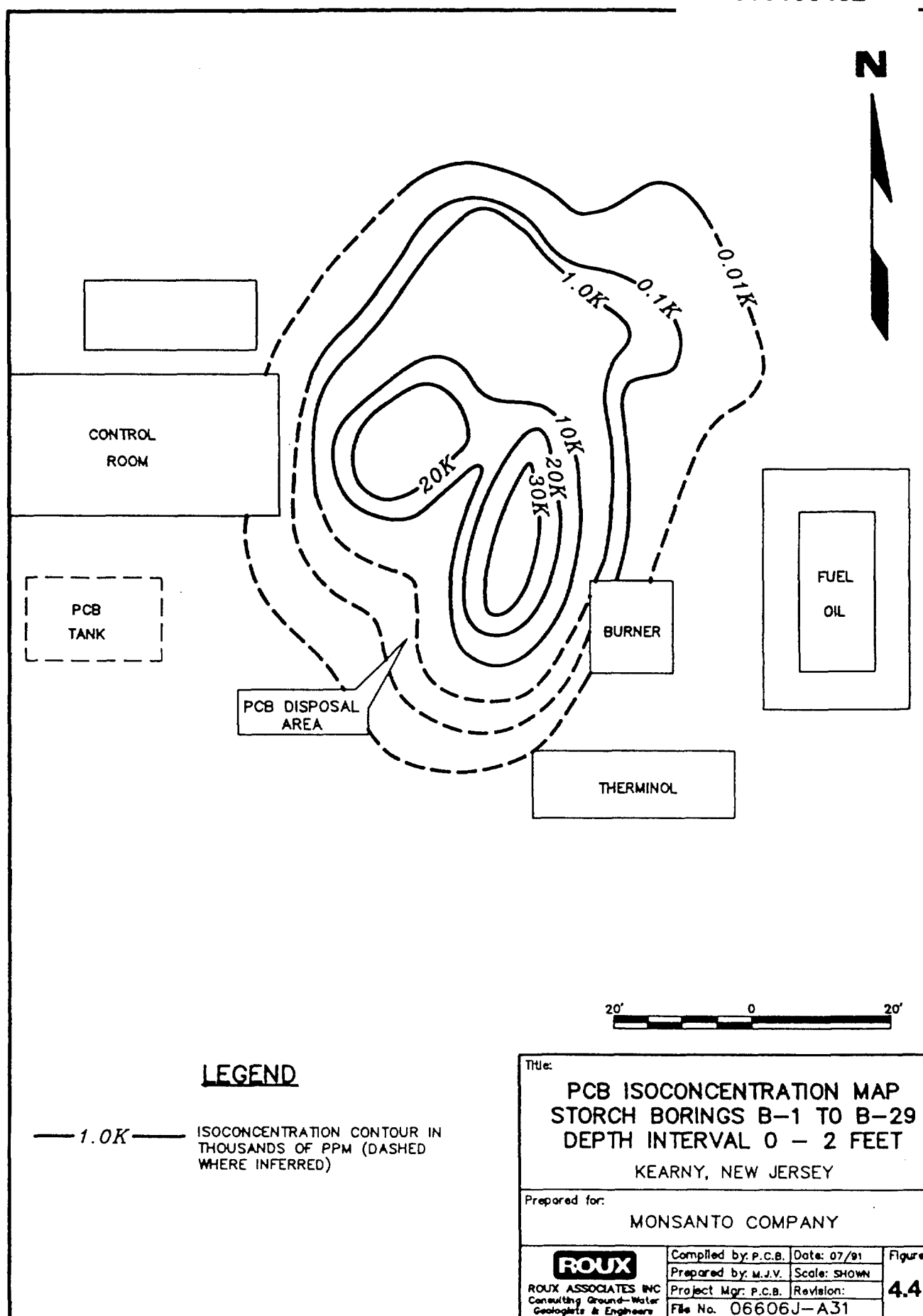
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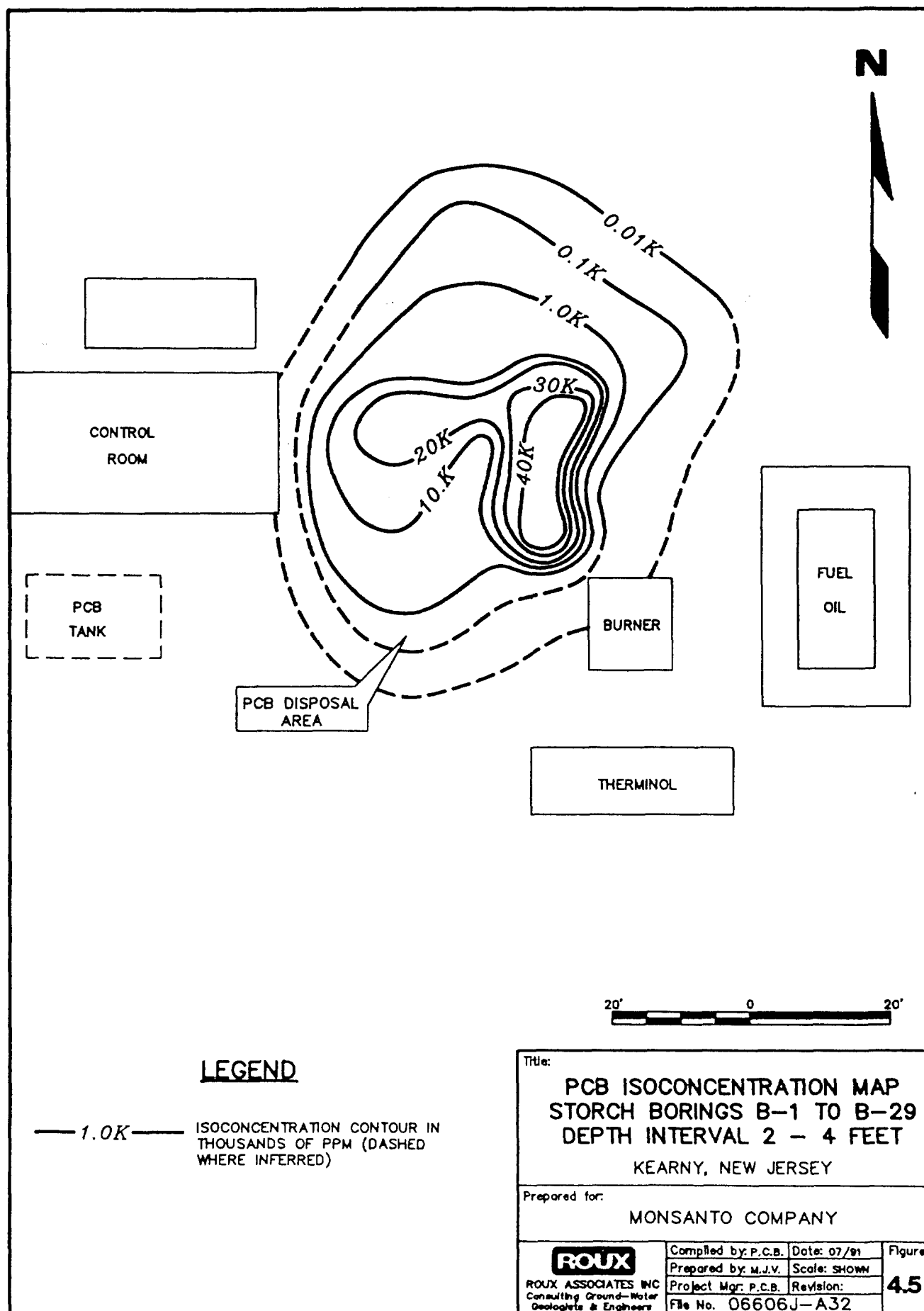
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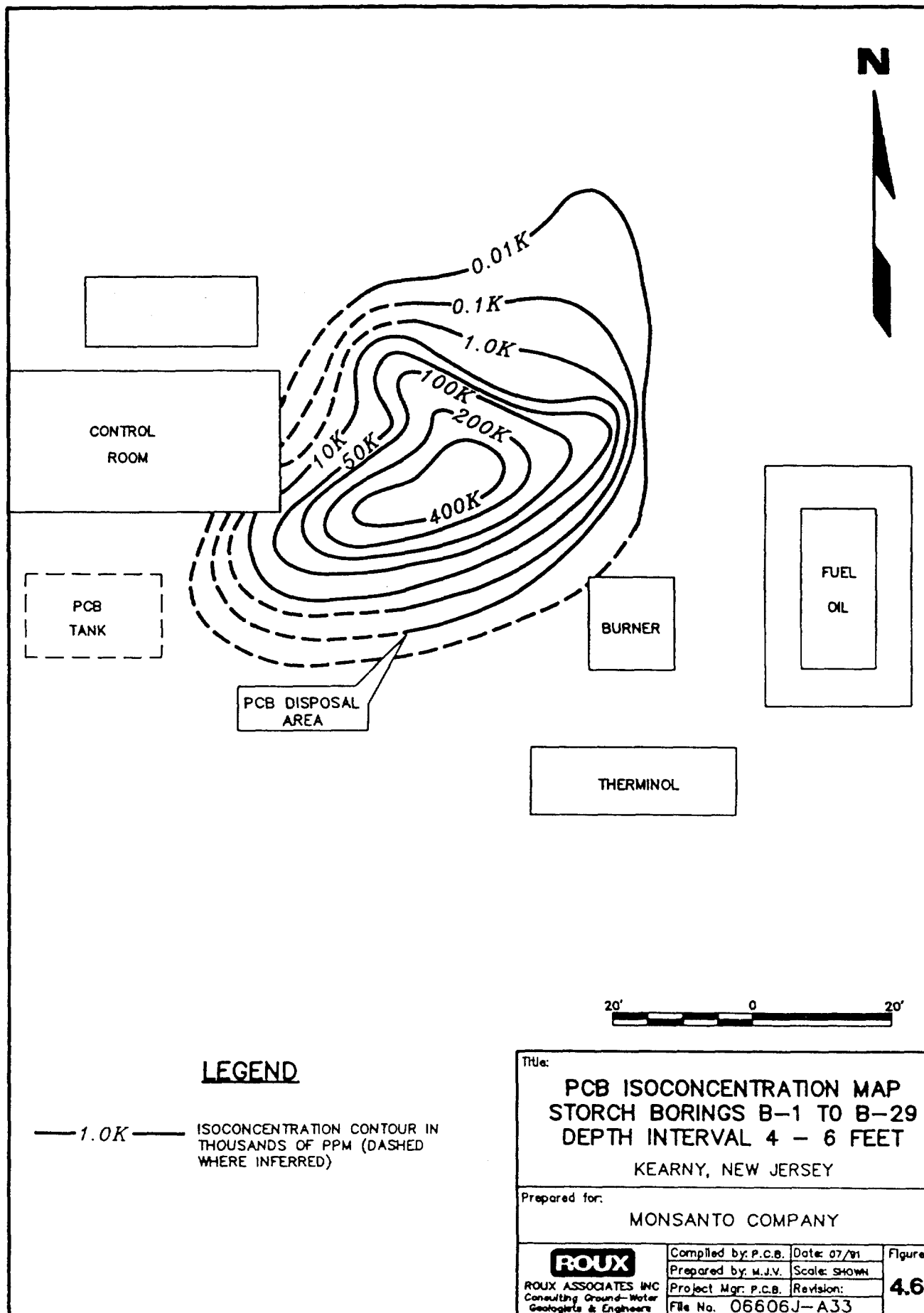


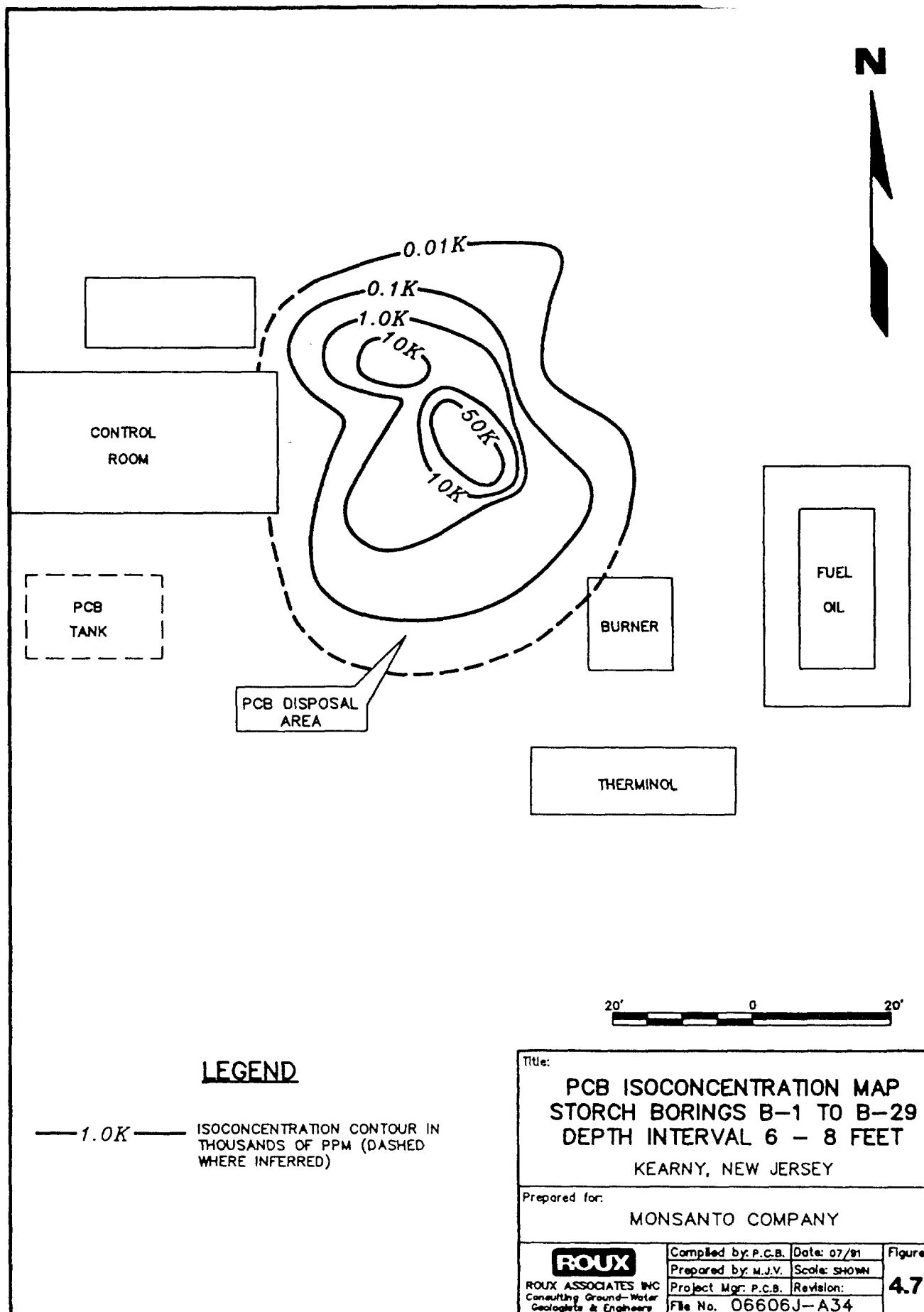
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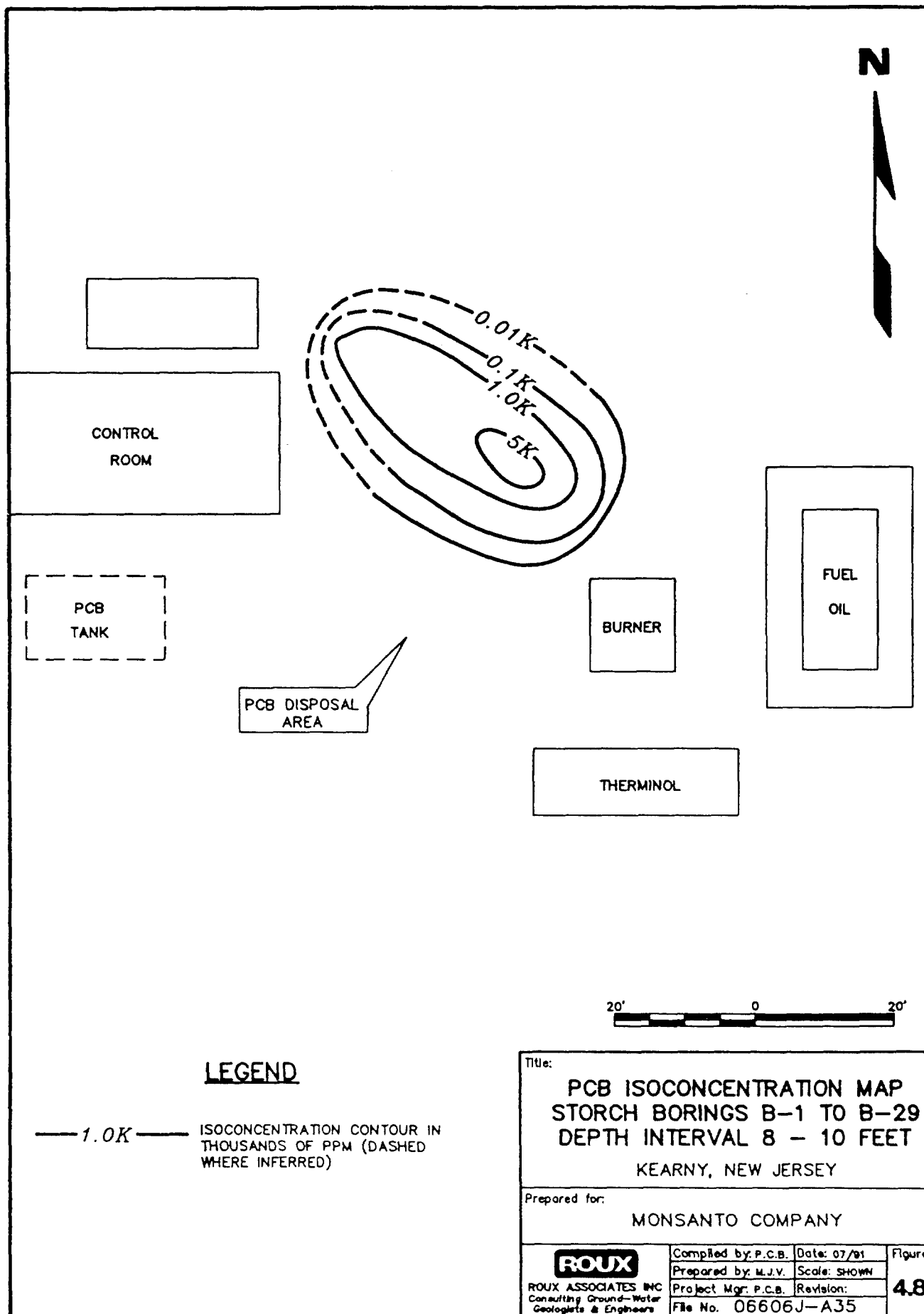


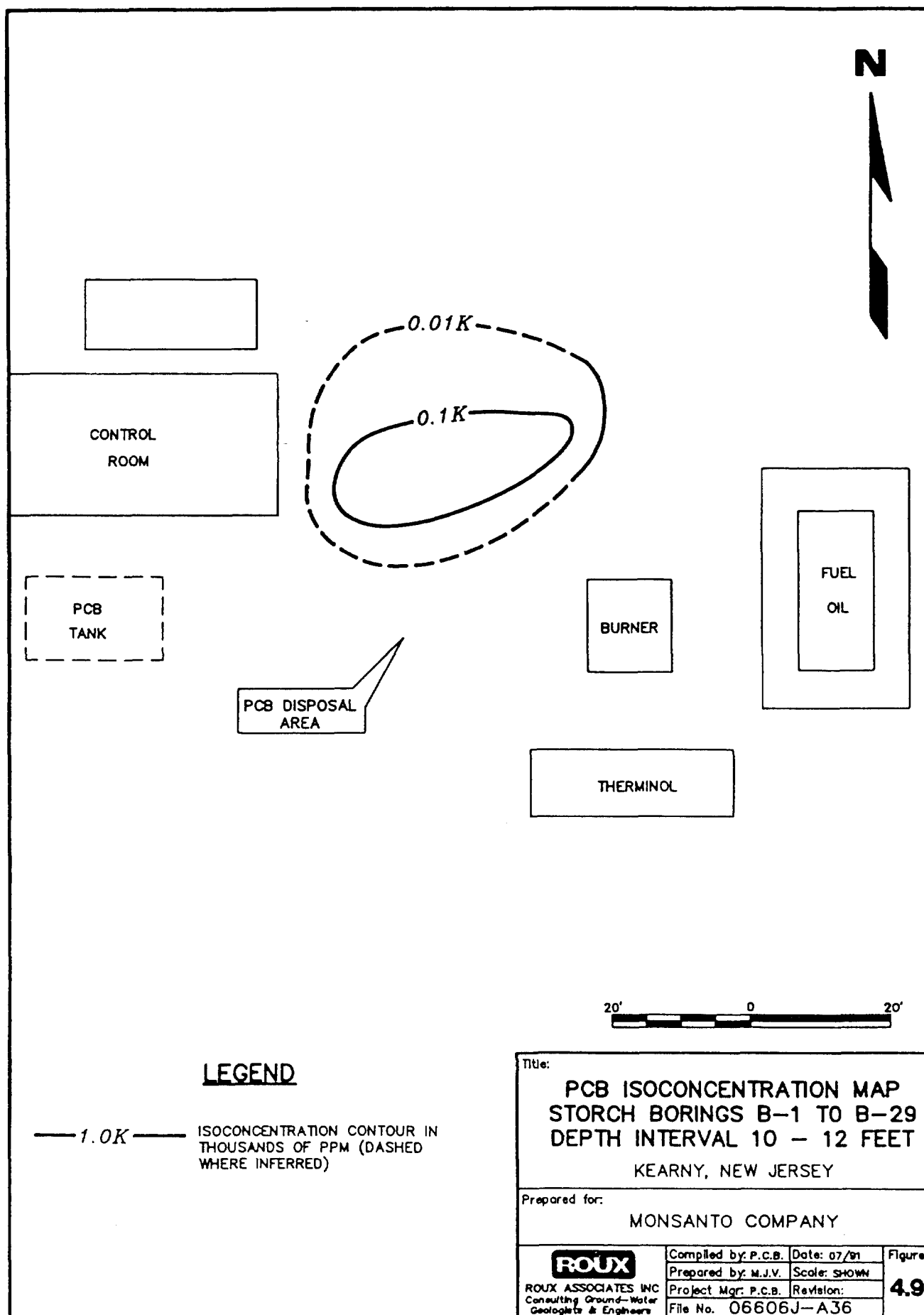


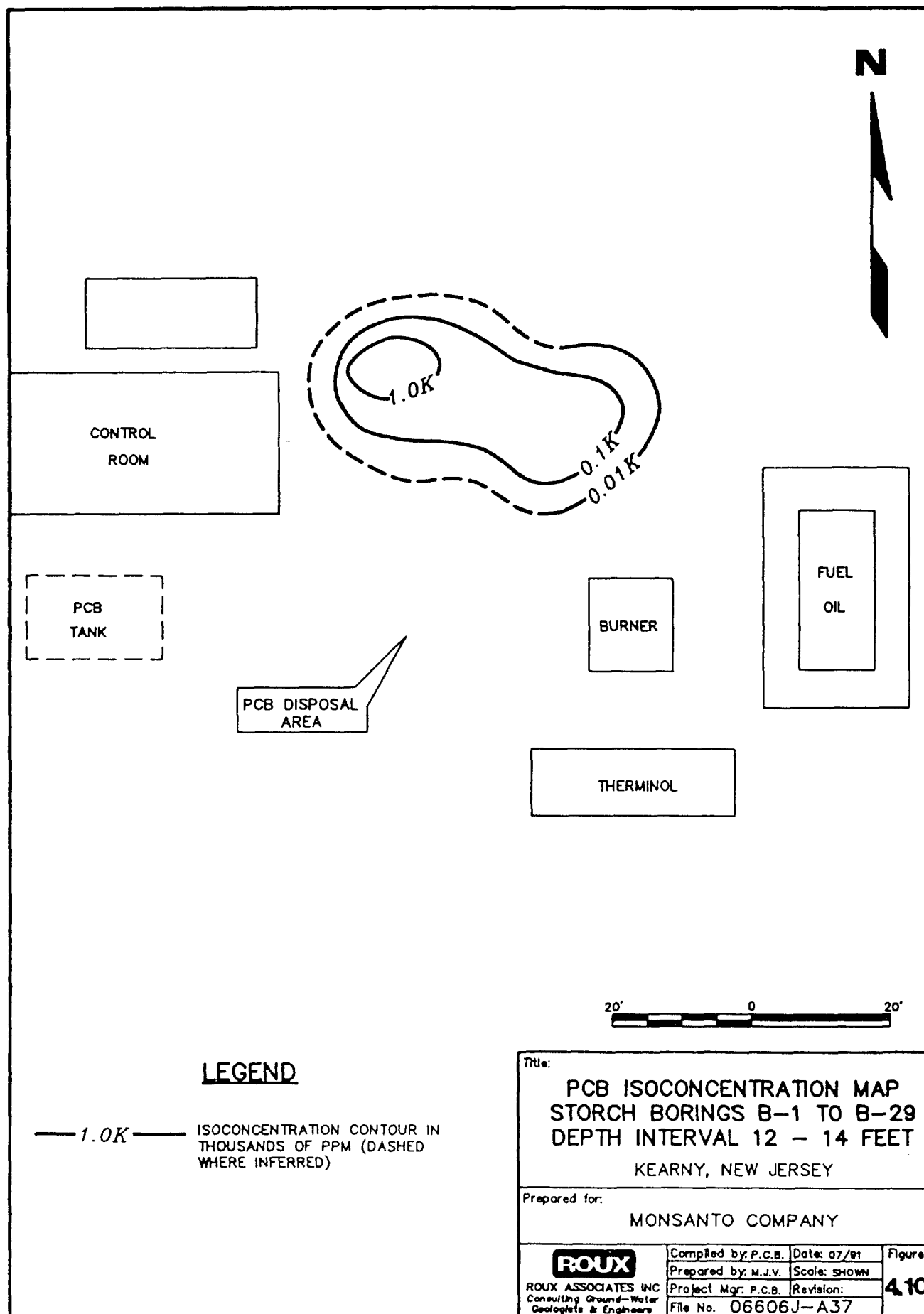


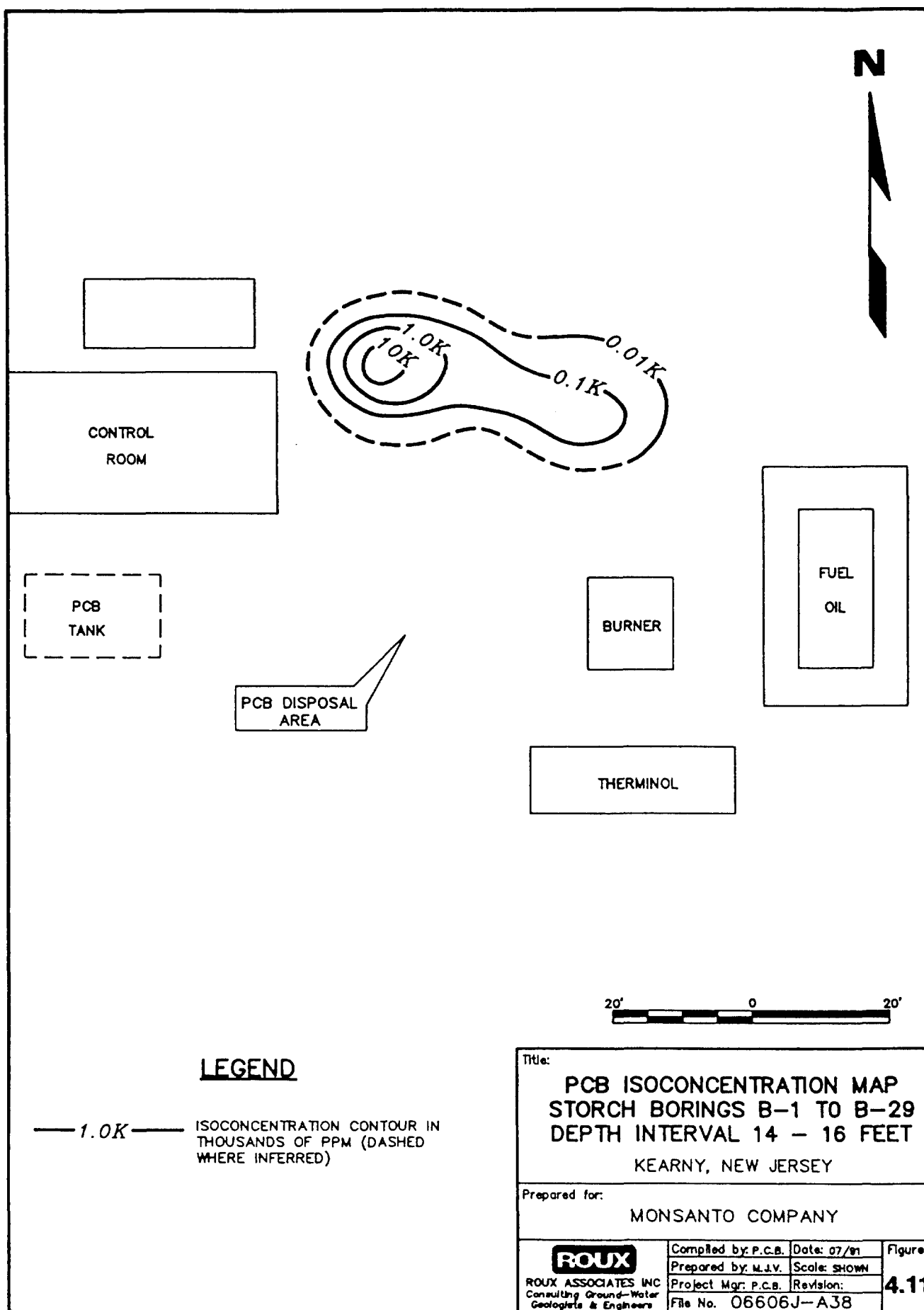


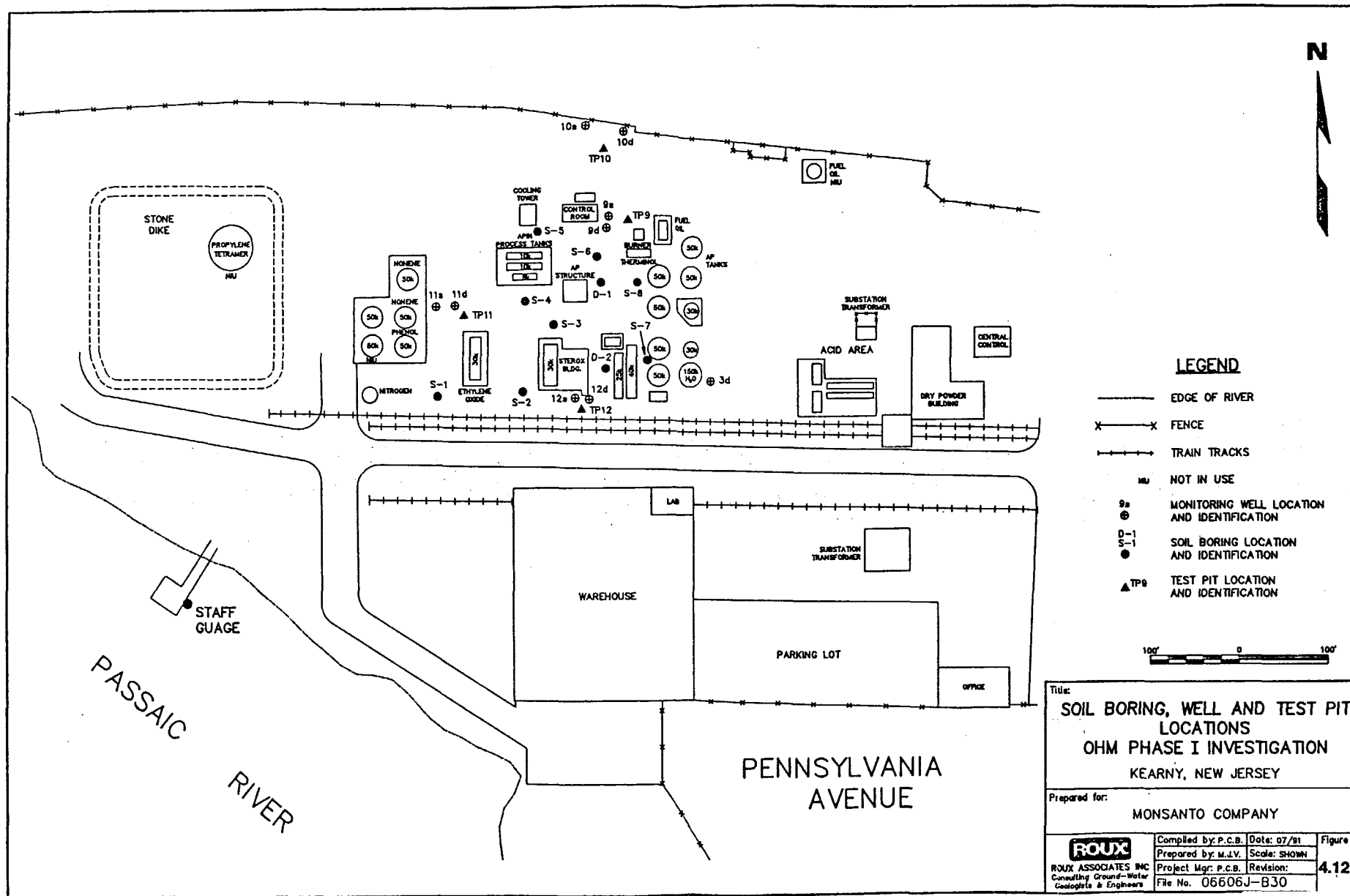




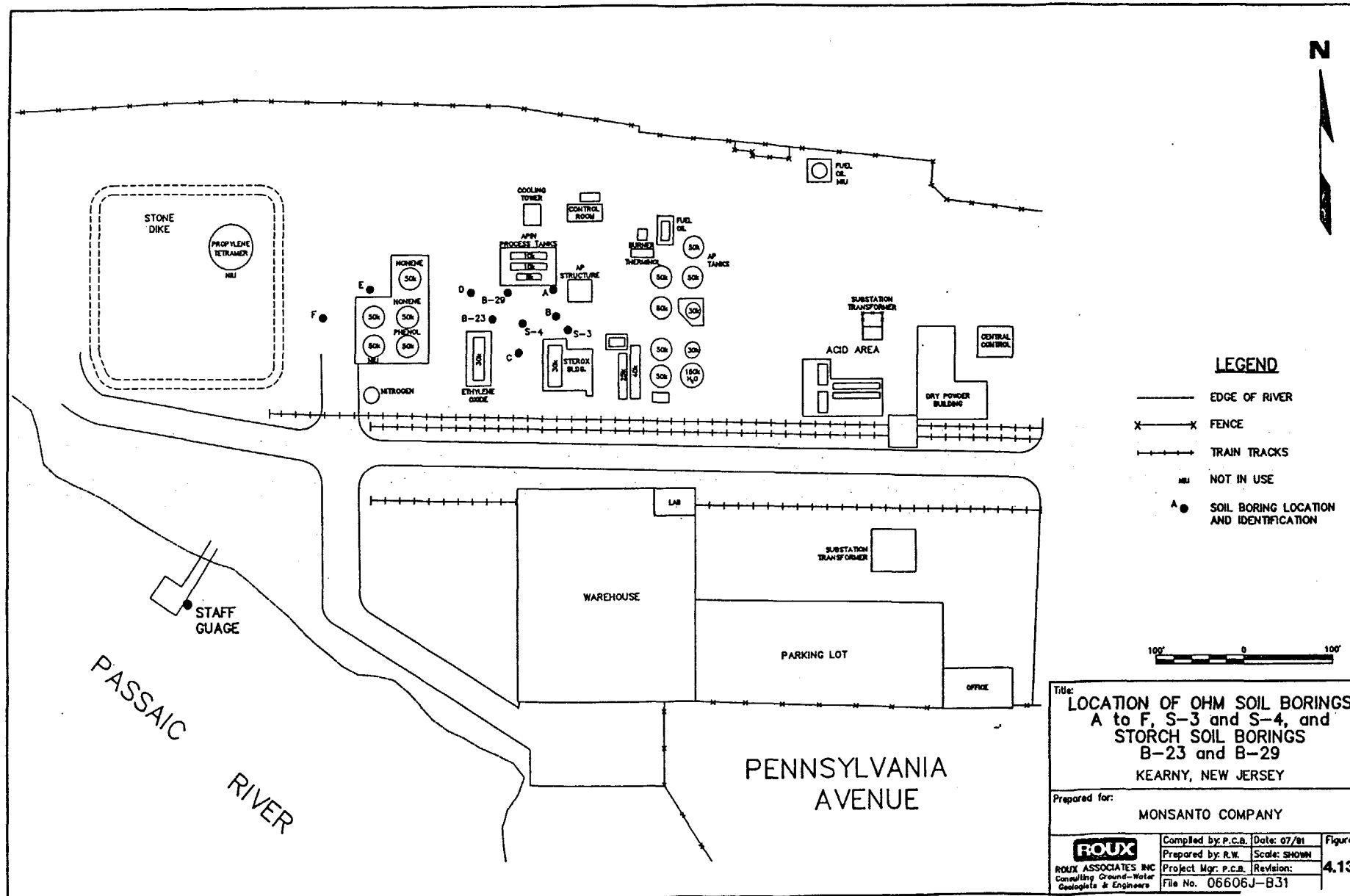




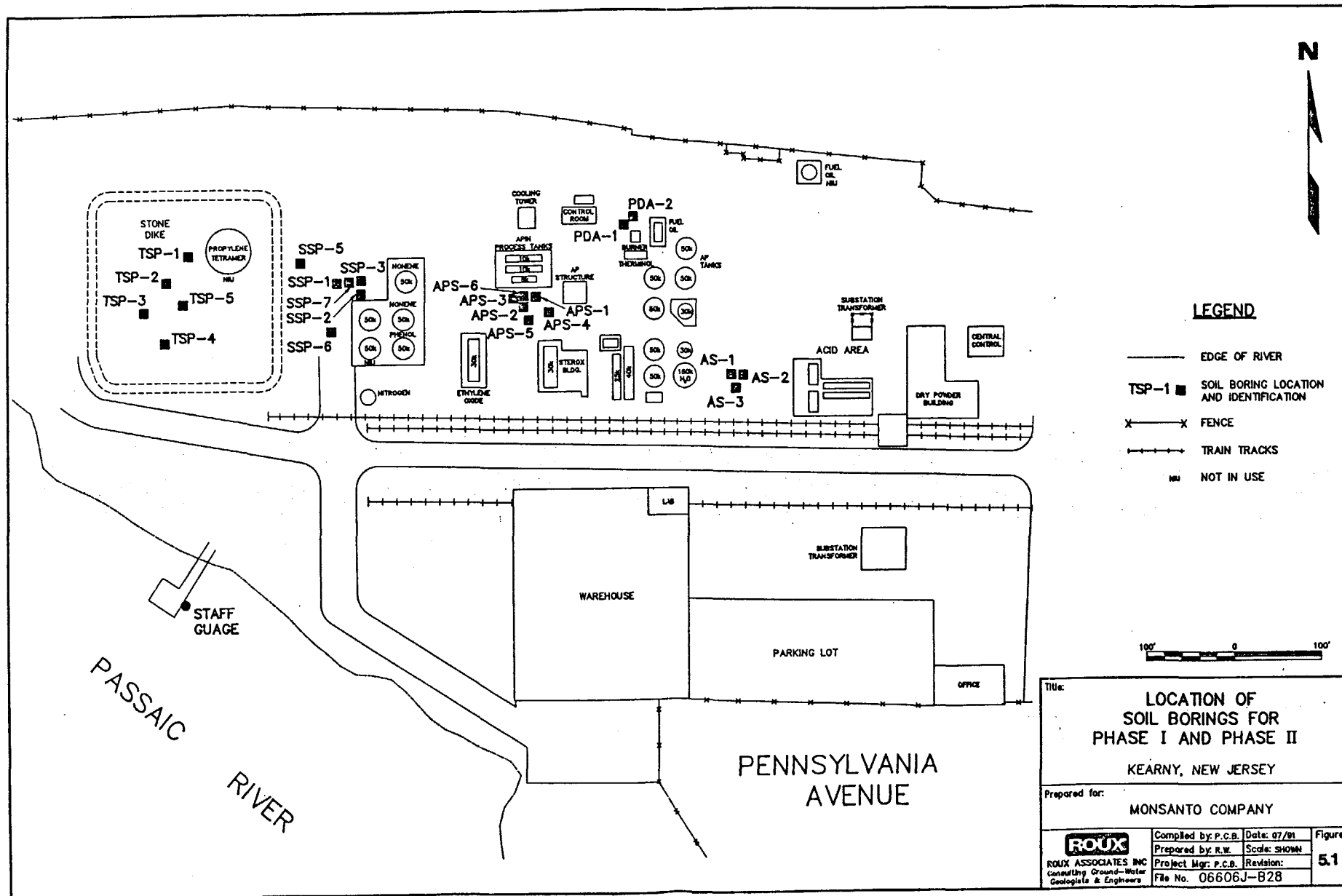




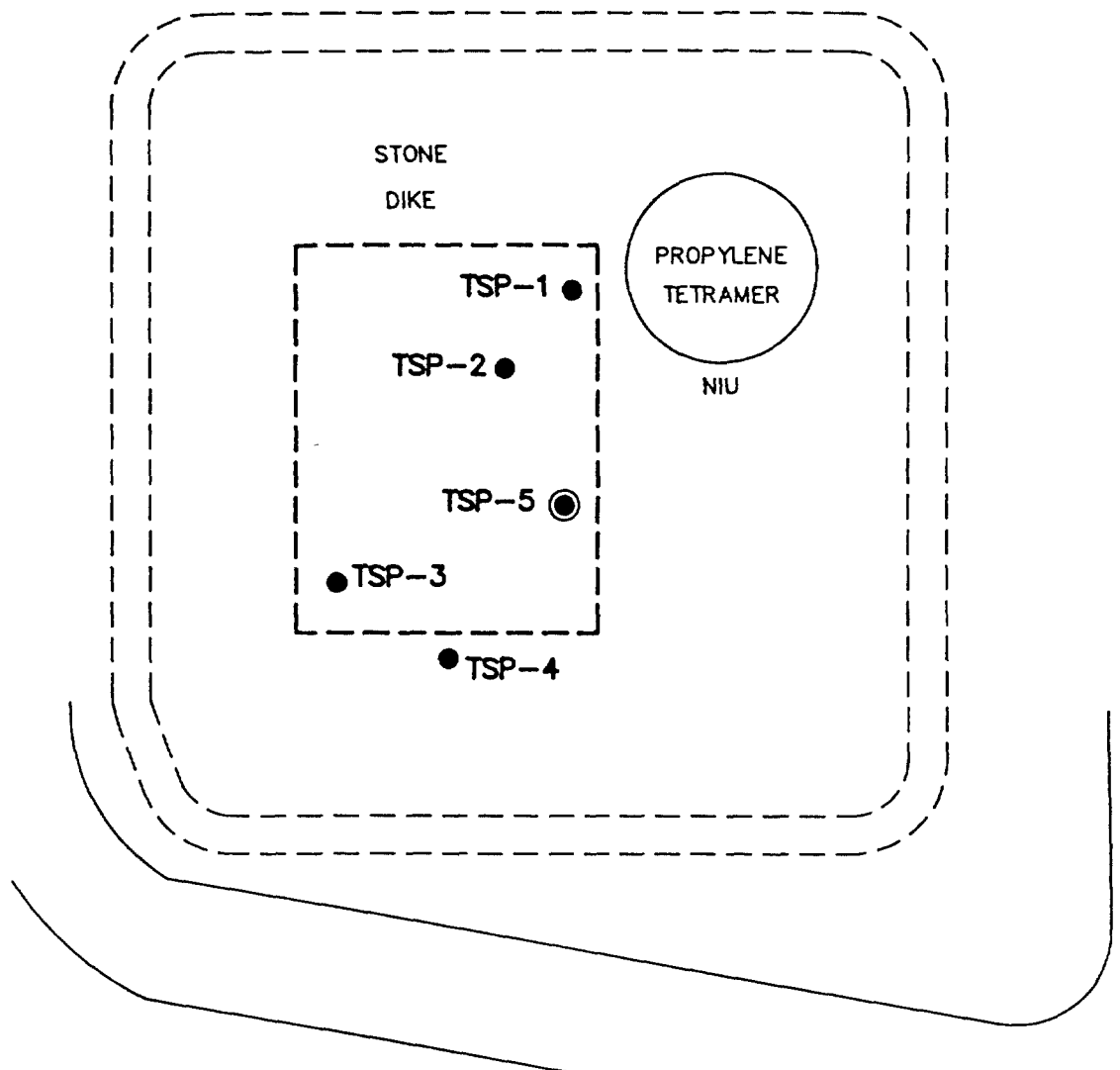
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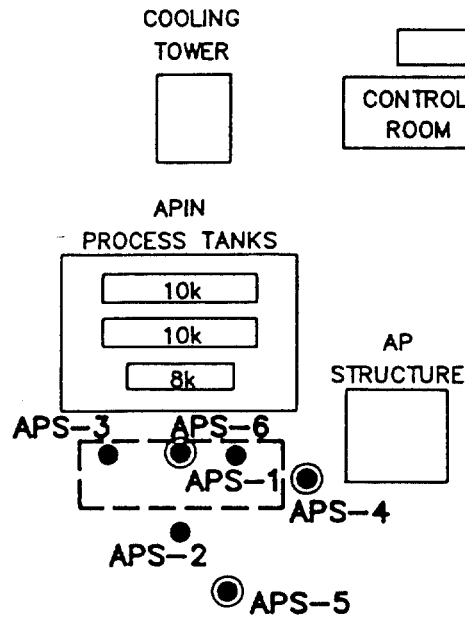
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LEGEND

- APPROXIMATE BOUNDARY OF TARGET AREA
- APPROXIMATE LOCATION OF PHASE I SOIL BORINGS
- ⊙ APPROXIMATE LOCATION OF PHASE II SOIL BORINGS

| | | | |
|-----------------------------------------------------------------------------------------|---------------------|--------------|----------------------|
| Title: | | | |
| TERTIARY SETTLING POND
SOIL BORING LOCATIONS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/91 | Figure
5.2 |
| | Prepared by: R.W. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A10 | | |

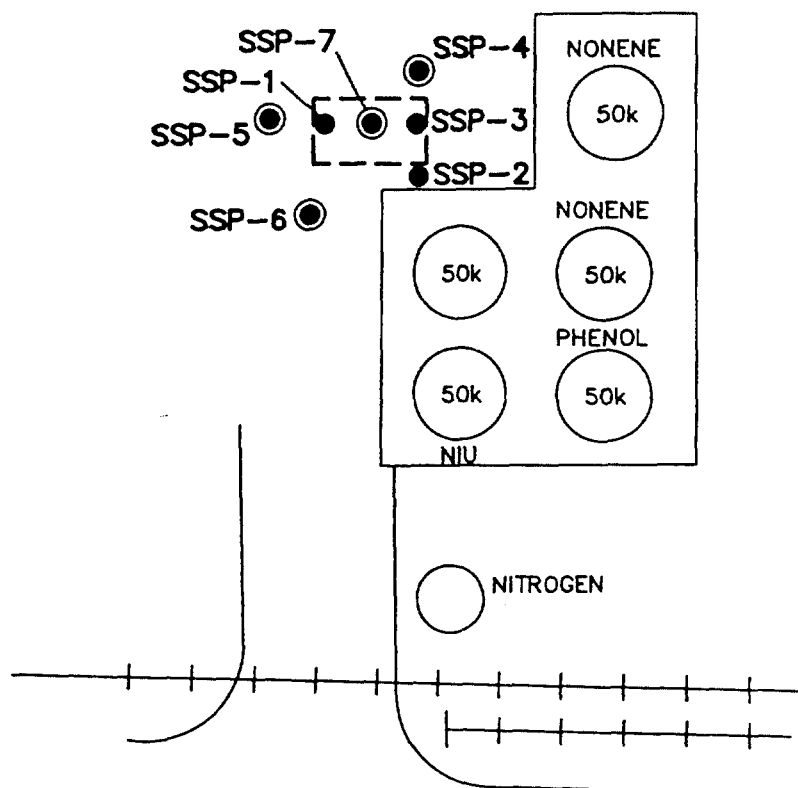


LEGEND

- APPROXIMATE BOUNDARY OF TARGET AREA
- APPROXIMATE LOCATION OF PHASE I SOIL BORINGS
- ⊙ APPROXIMATE LOCATION OF PHASE II SOIL BORINGS



| | | | |
|-----------------------------------------------------------------------------------------|---------------------|--------------|------------|
| Title: | | | |
| AP/STEROX SUMP
SOIL BORING LOCATIONS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/91 | Figure |
| | Prepared by: J.P.S. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A09 | | |
| | | | 5.3 |

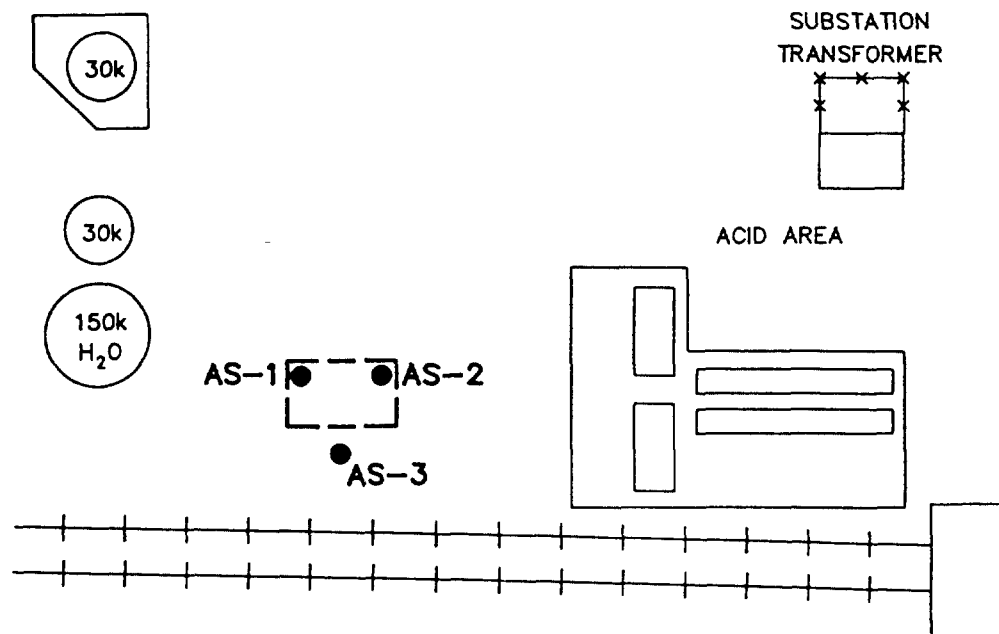


LEGEND

- APPROXIMATE BOUNDARY OF TARGET AREA
- APPROXIMATE LOCATION OF PHASE I SOIL BORINGS
- ⊙ APPROXIMATE LOCATION OF PHASE II SOIL BORINGS

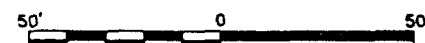


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| Title: | | | |
| SECONDARY SETTLING POND
SOIL BORING LOCATIONS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/91 | Figure
5.4 |
| | Prepared by: J.P.S. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A08 | | | |

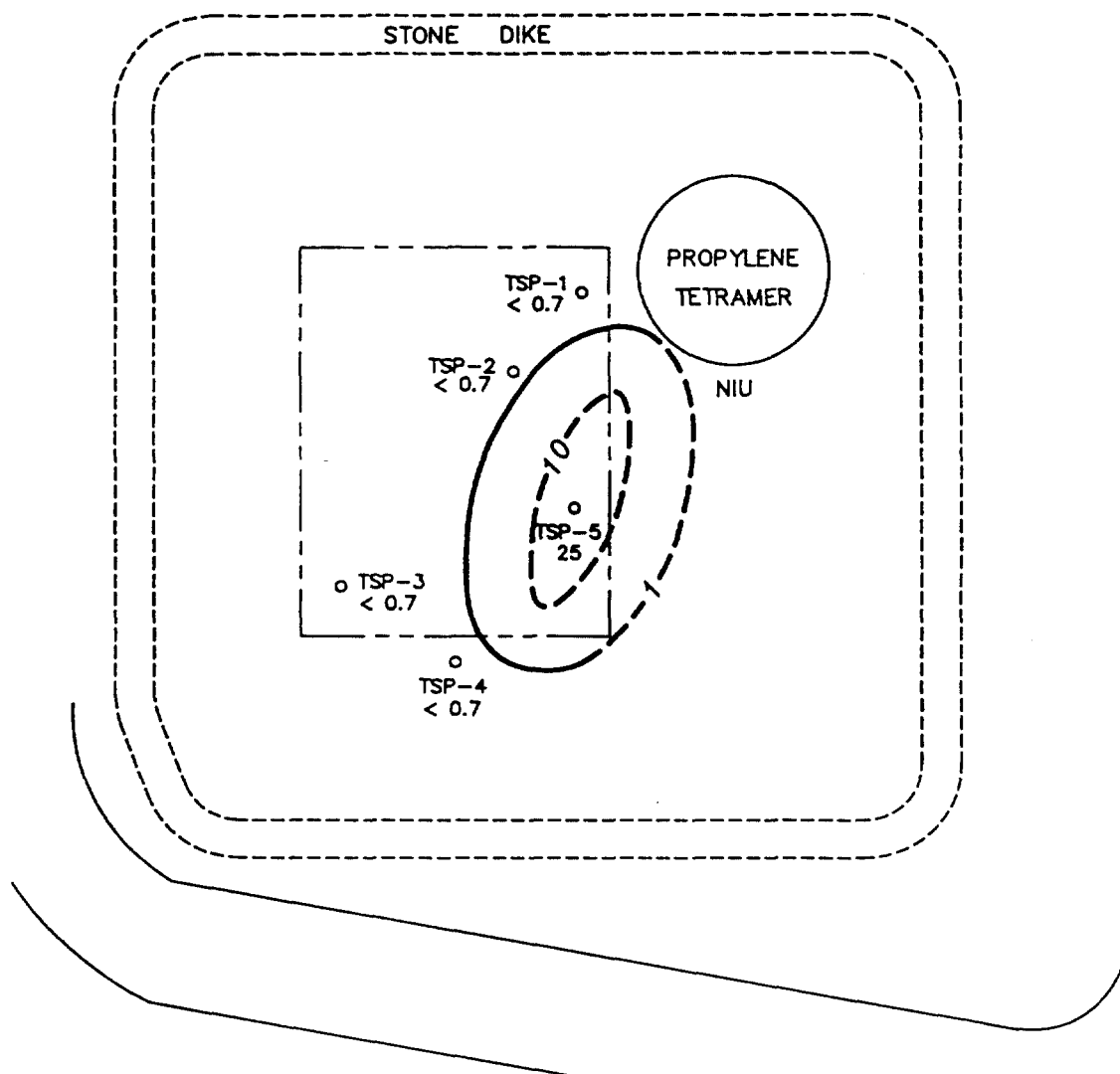


LEGEND

- APPROXIMATE BOUNDARY OF
TARGET AREA
- APPROXIMATE LOCATION OF PHASE I
SOIL BORINGS



| | | | |
|-----------------------------------------------------------------------------------------|---------------------|--------------|----------------------|
| Title: | | | |
| ACID SUMP
SOIL BORING LOCATIONS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/81 | Figure
5.5 |
| | Prepared by: J.P.S. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| | File No. 06606J-A04 | | |

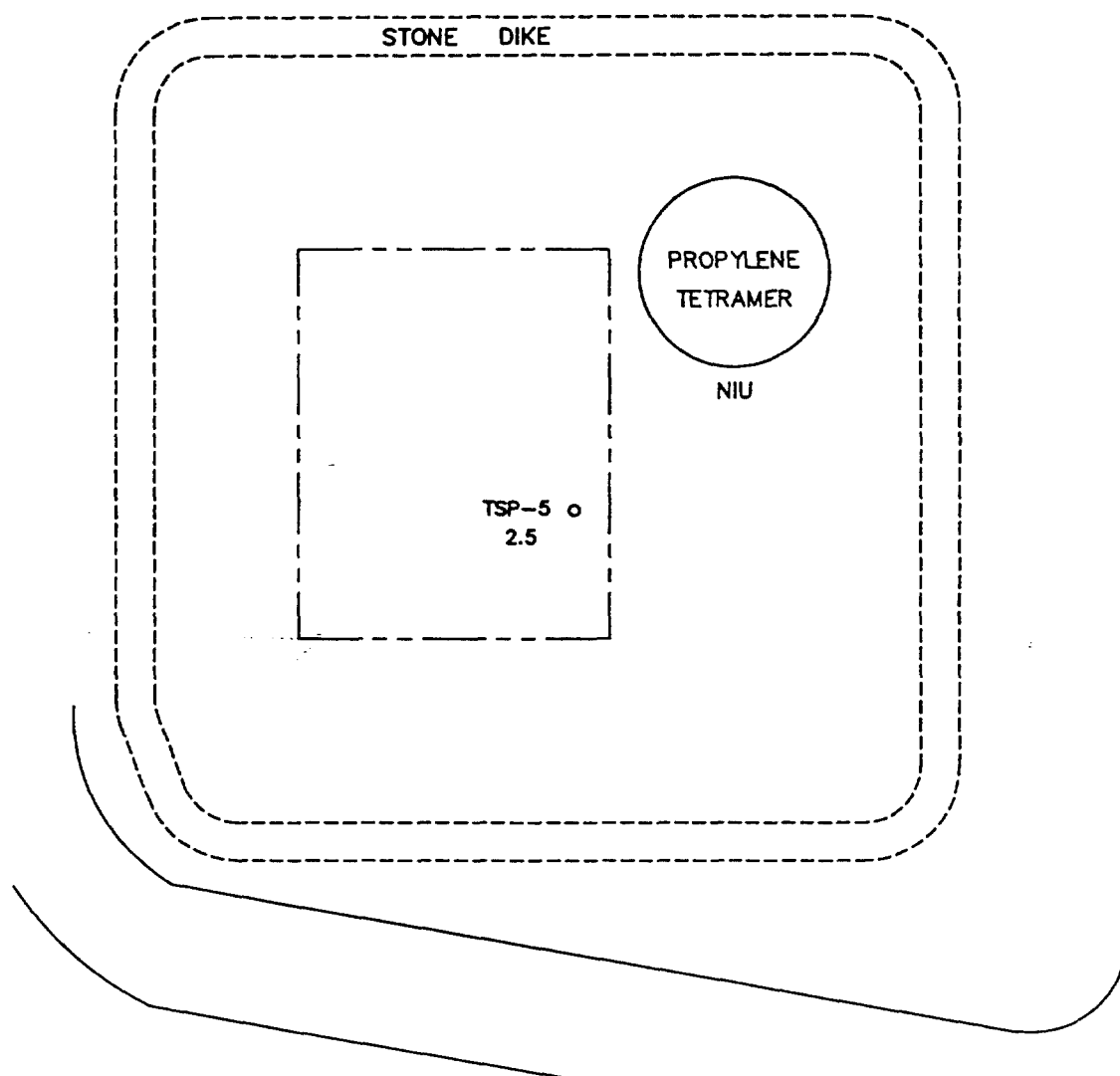


LEGEND

- TSP-1 APPROXIMATE LOCATION AND DESIGNATION OF ROUX RI SOIL BORINGS
- < 0.7 CONCENTRATION OF TOTAL VOLATILES IN mg/kg
- 10 — ISOCONCENTRATION CONTOUR, mg/kg (DASHED WHERE INFERRED)
- — — PREVIOUSLY ESTIMATED BOUNDARY OF TARGET AREA

50' 0 50'

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: ISOCONCENTRATION MAP
VOLATILES ORGANICS AT 4 TO 6
FOOT DEPTHS
TERTIARY SETTLING POND
KEARNY, NEW JERSEY | | | |
| Prepared for: MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 08/91 | Figure
56 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A23 | | | |



LEGEND

○
TSP-5 APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS

2.5 CONCENTRATION OF TOTAL VOLATILES
IN mg/kg

— — — — — PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA

50' 0 50'

Title: **ISOCONCENTRATION MAP
VOLATILE ORGANICS AT 9 TO 11
FOOT DEPTHS
TERTIARY SETTLING POND
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: P.C.B. Date: 05/91

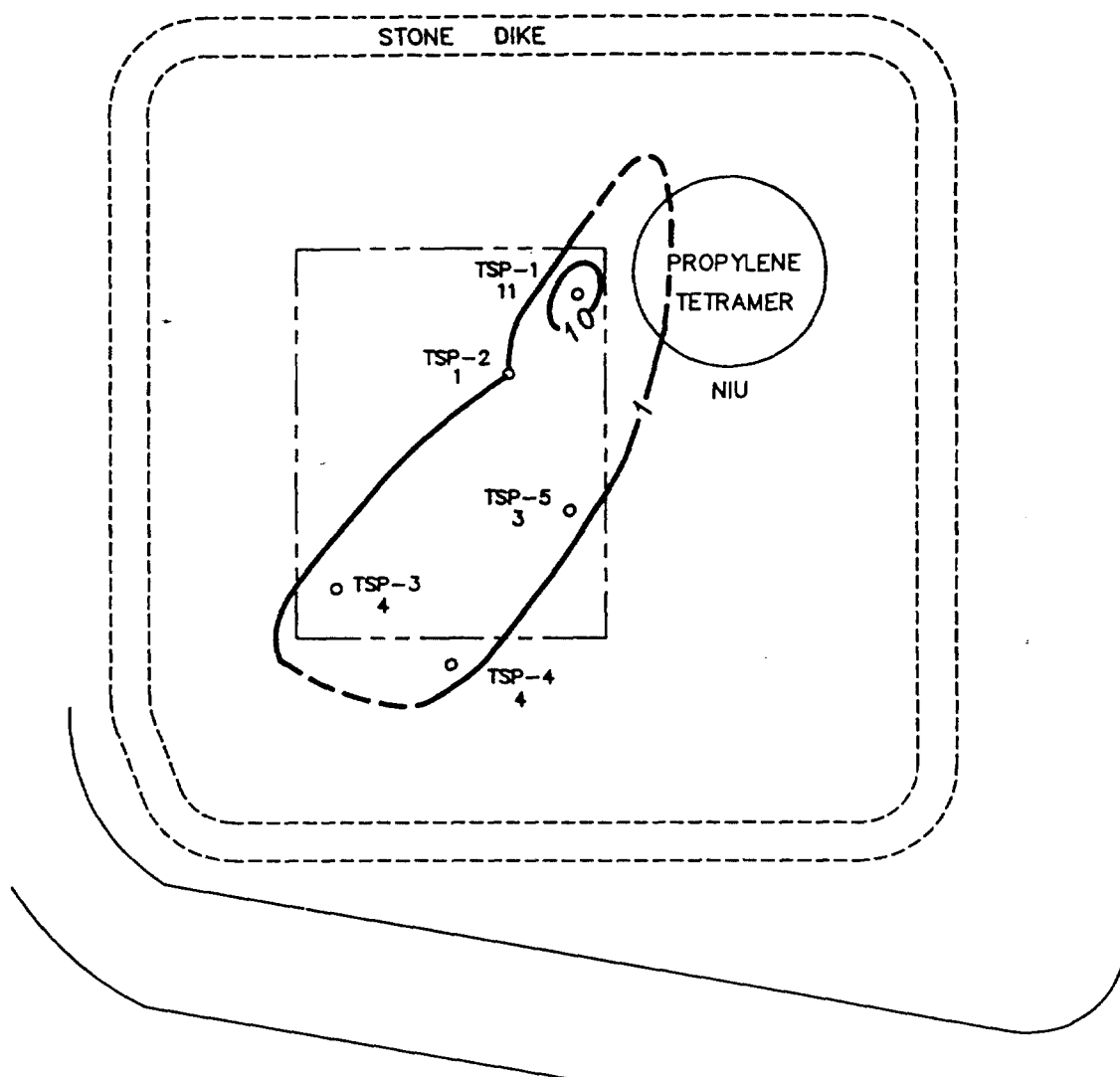
Prepared by: M.J.V. Scale: SHOWN

Project Mgr: P.C.B. Revision:

File No. 06606J-A24

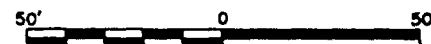
Figure

5.7



LEGEND

- TSP-1 APPROXIMATE LOCATION AND DESIGNATION OF ROUX RI SOIL BORINGS
- 11 CONCENTRATION OF TOTAL PCBs IN mg/kg
- 1 — ISOCONCENTRATION CONTOUR, mg/kg (DASHED WHERE INFERRED)
- — — PREVIOUSLY ESTIMATED BOUNDARY OF TARGET AREA



Title:

ISOCONCENTRATION MAP PCBs AT 4 TO 6 FOOT DEPTHS TERTIARY SETTLING POND

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUX

 ROUX ASSOCIATES INC
 Consulting Ground-Water
 Geologists & Engineers

Compiled by: P.C.B. Date: 08/81

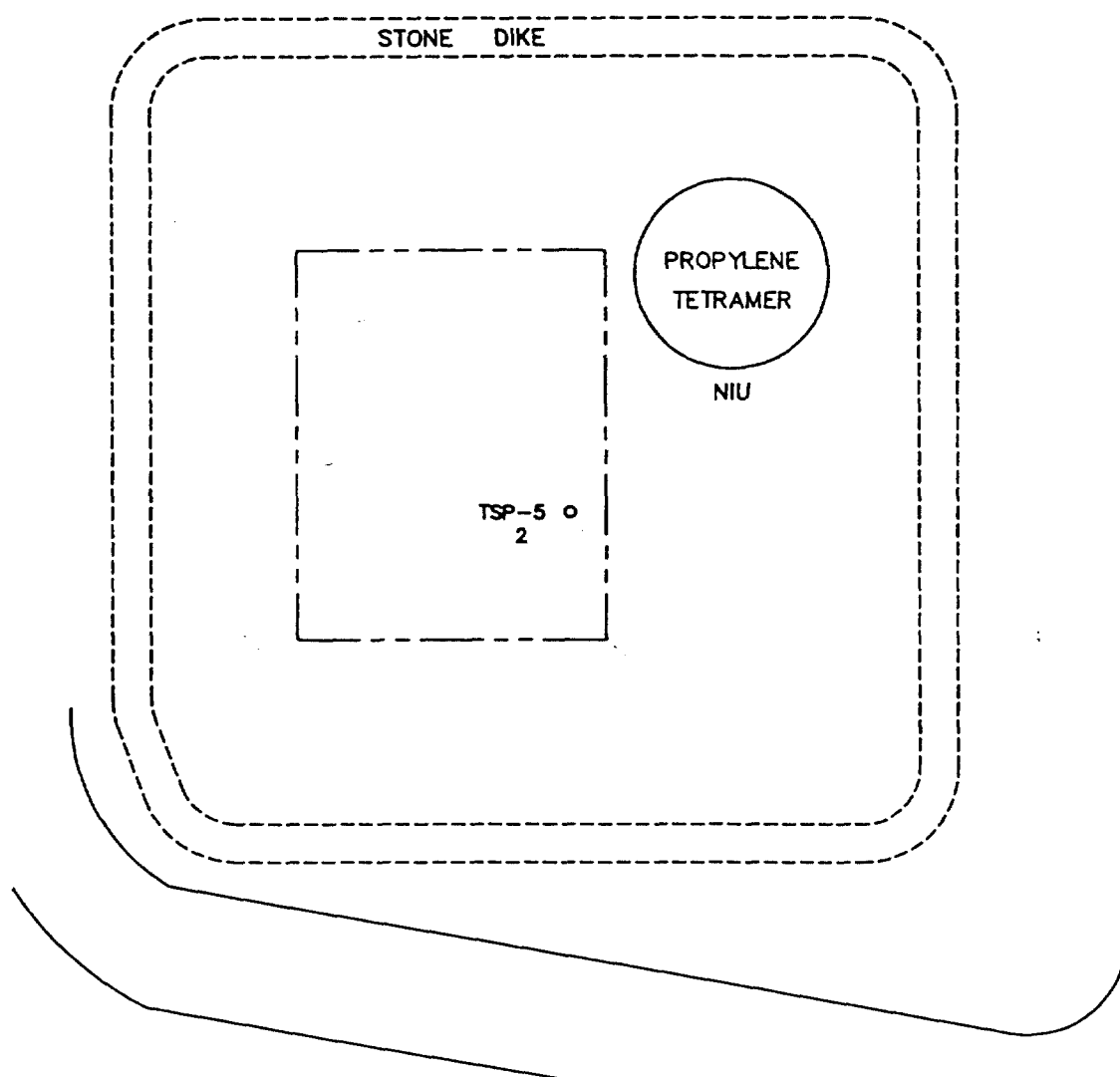
Prepared by: M.I.V. Scale: SHOWN

Project Mgr: P.C.B. Revision:

File No. 06606J-A20

Figure

58



LEGEND

○
TSP-5

APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS

2

CONCENTRATION OF TOTAL PCBs IN
mg/kg

— — — — —

PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA



Title:

ISOCONCENTRATION MAP PCBs AT 9 TO 11 FOOT DEPTHS TERTIARY SETTLING POND

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: P.C.B. Date: 06/91

Prepared by: M.I.V. Scale: SHOWN

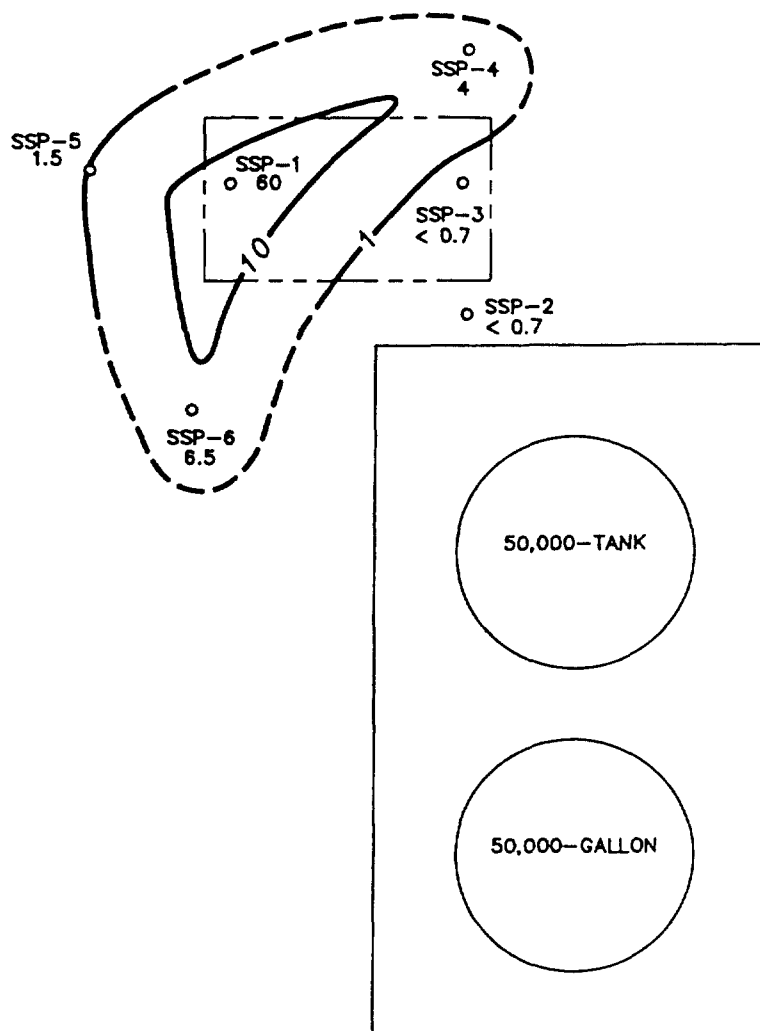
Project Mgr: P.C.B. Revision:

File No. 06606J-A22

Figure

59

STONE DIKE

**LEGEND**○
SSP-1APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS

60

CONCENTRATION OF TOTAL VOLATILES
IN mg/kg

— 10 —

ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)

- - - - -

PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA

20' 0 20'

Title: **ISOCONCENTRATION MAP
VOLATILE ORGANICS AT 4 TO 6
FOOT DEPTHS
SECONDARY SETTLING POND
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

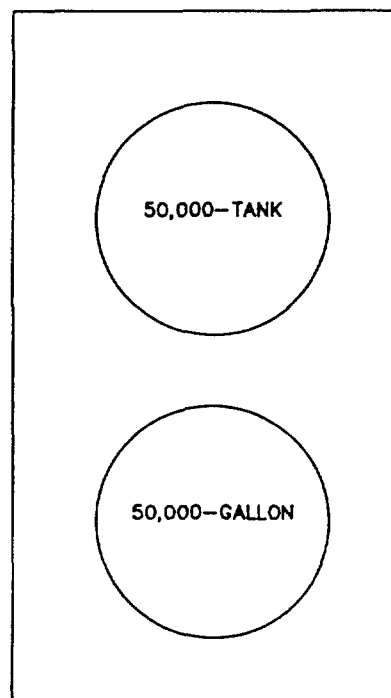
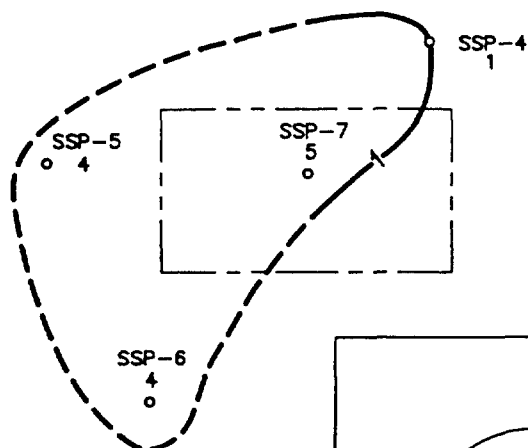
ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: P.C.B. Date: 07/91
Prepared by: M.J.V. Scale: SHOWN
Project Mgr: P.C.B. Revision:
File No. 06606J-A17

Figure

5.10

STONE DIKE

**LEGEND**

- SSP-4 APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS
- 1 CONCENTRATION OF TOTAL VOLATILES
IN mg/kg
- 1 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- — — — PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA



Title: **ISOCONCENTRATION MAP
VOLATILE ORGANICS AT 9 TO 11
FOOT DEPTHS
SECONDARY SETTLING POND
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY**ROUX**

ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

Compiled by: P.C.B. Date: 07/91

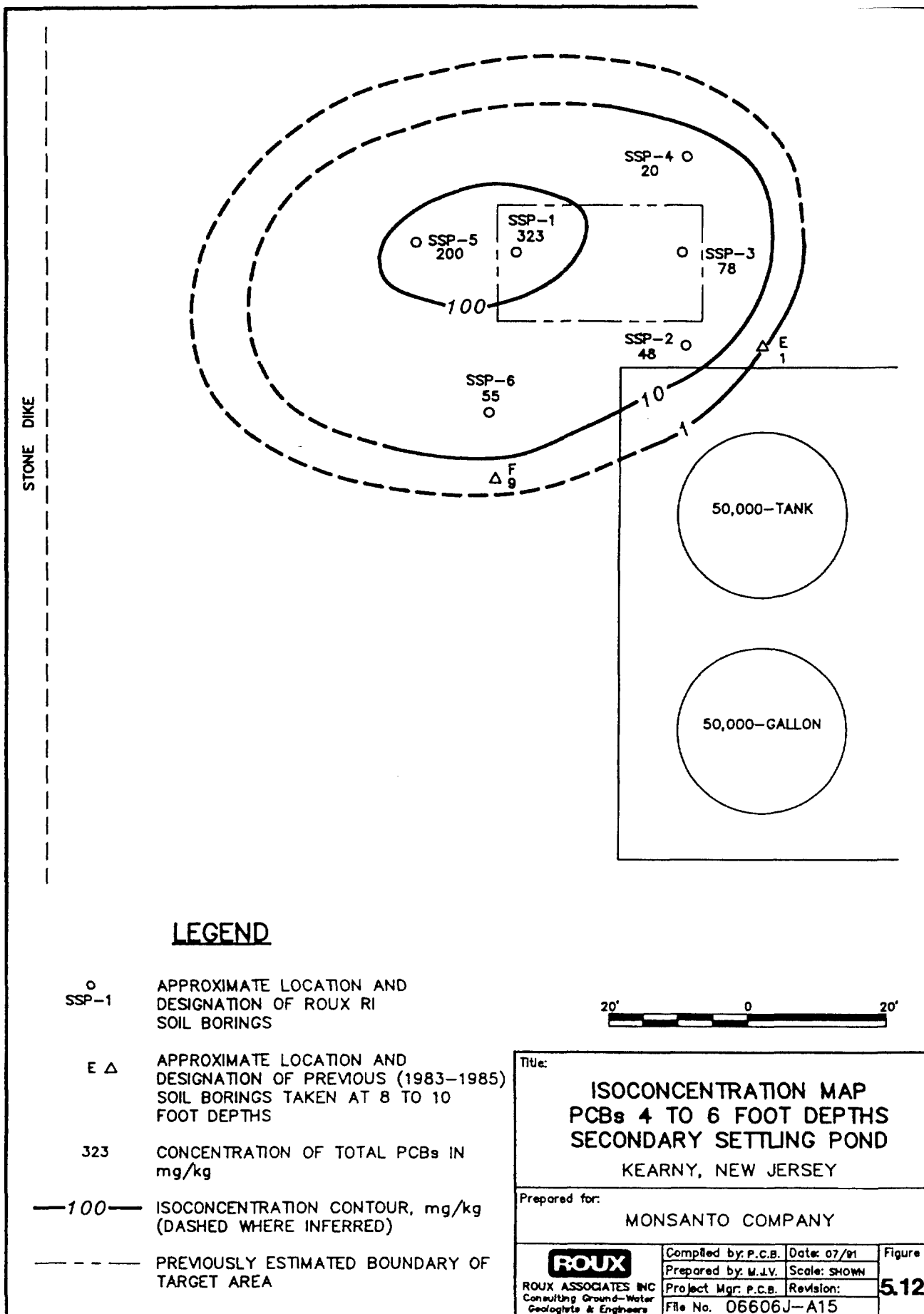
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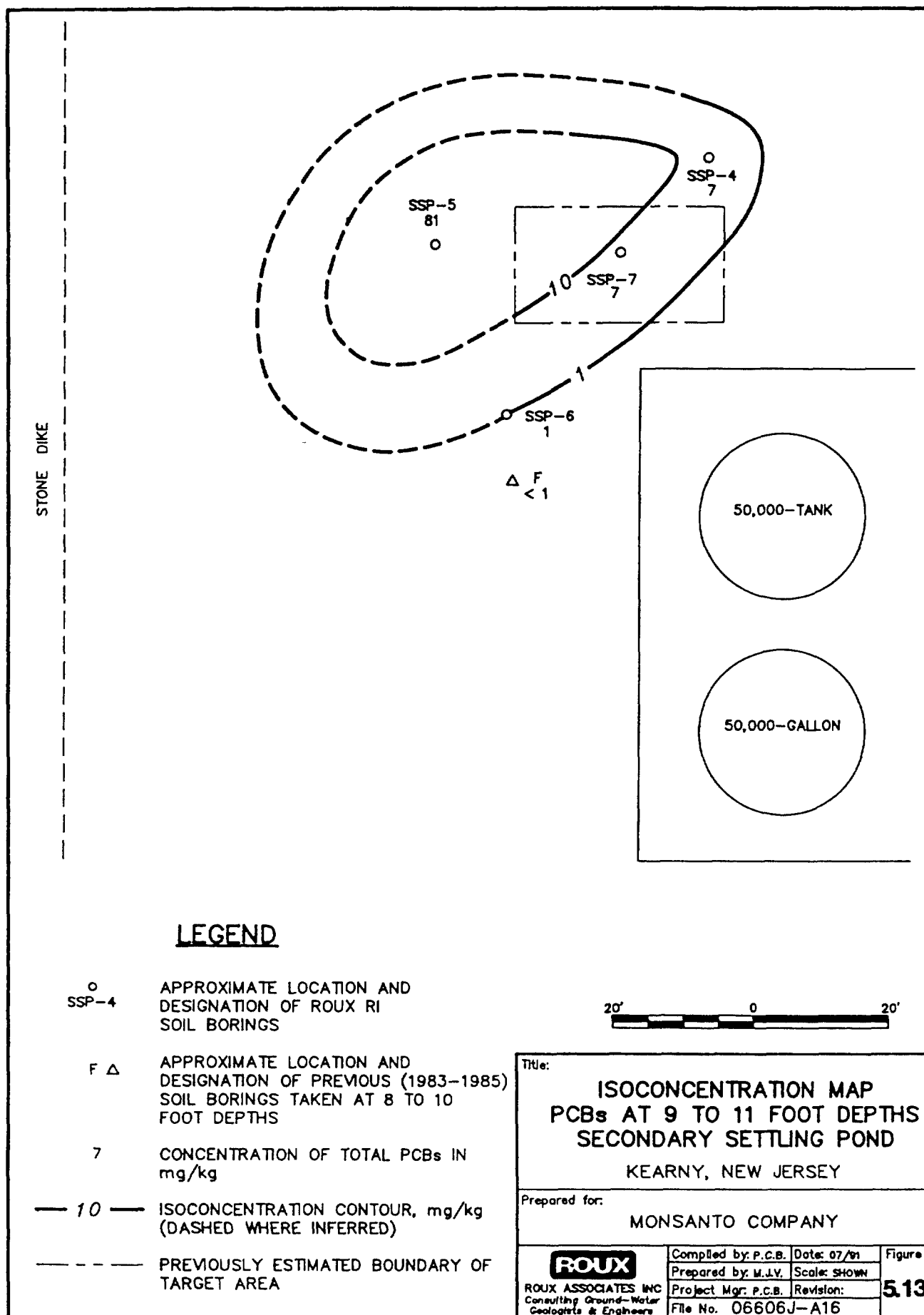
Project Mgr: P.C.B. Revision:

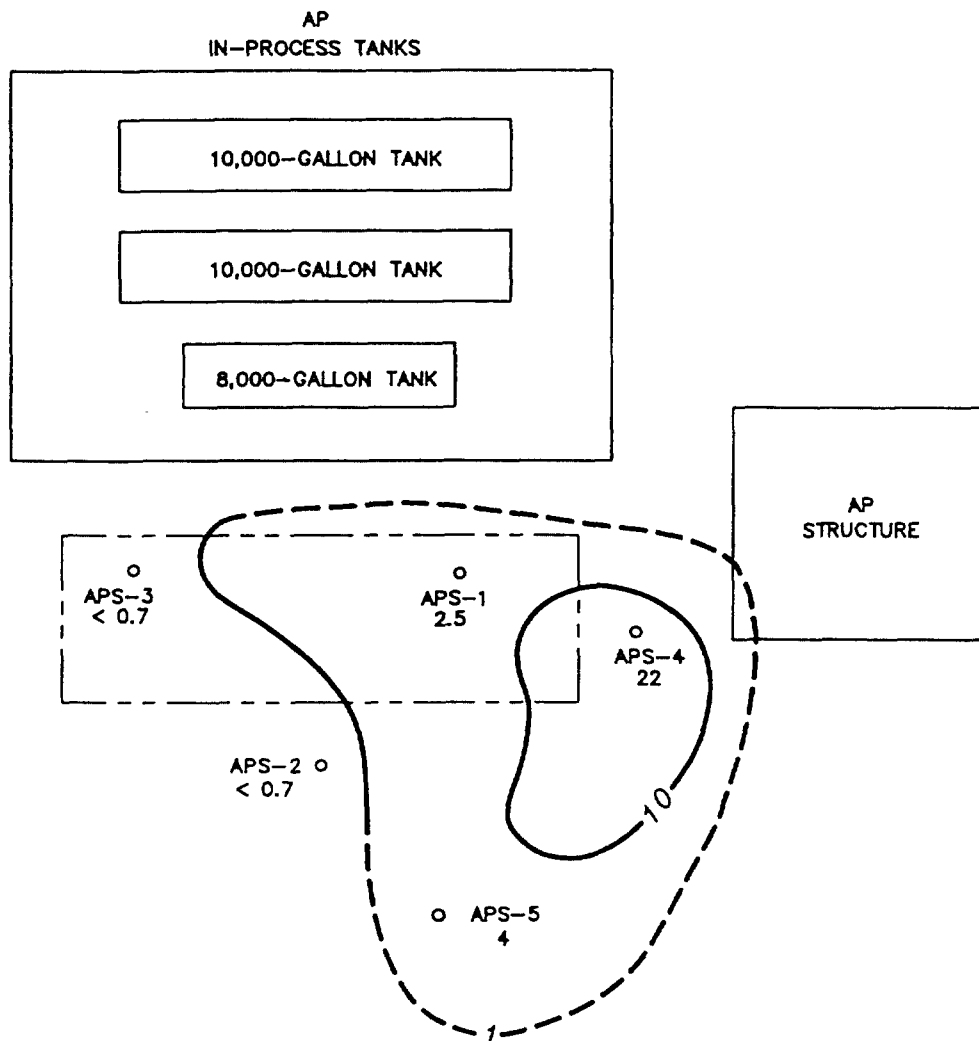
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Figure

5.11

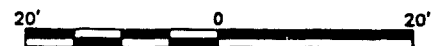




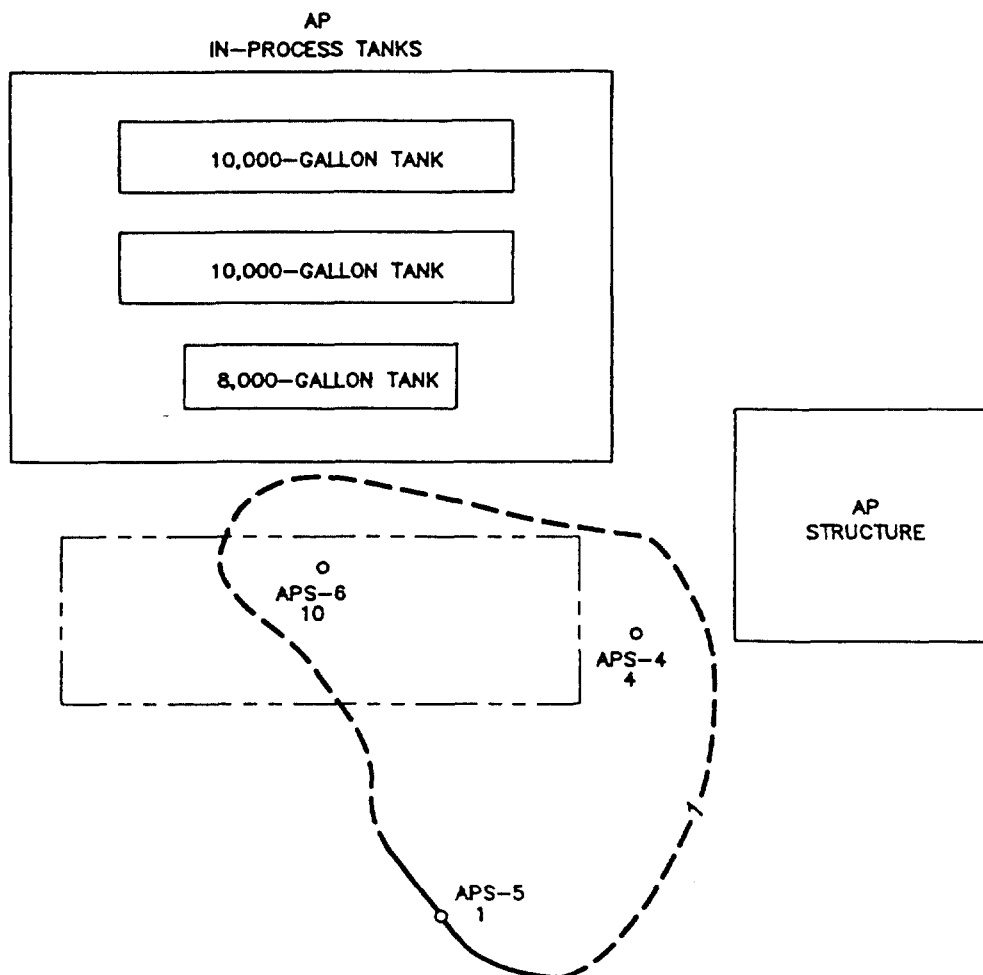


LEGEND

- APS-1 APPROXIMATE LOCATION AND DESIGNATION OF ROUX RI SOIL BORINGS
- 2.5 CONCENTRATION OF TOTAL VOLATILES IN mg/kg
- 10 — ISOCONCENTRATION CONTOUR, mg/kg (DASHED WHERE INFERRED)
- - - - PREVIOUSLY ESTIMATED BOUNDARY OF TARGET AREA



| | | | |
|--------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|-----------------------|
| Title: ISOCONCENTRATION MAP
VOLATILE ORGANICS AT 4 TO 6
FOOT DEPTHS
AP/STEROX SUMP
KEARNY, NEW JERSEY | | | |
| Prepared for: MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/91 | Figure
5.14 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A13 | | | |

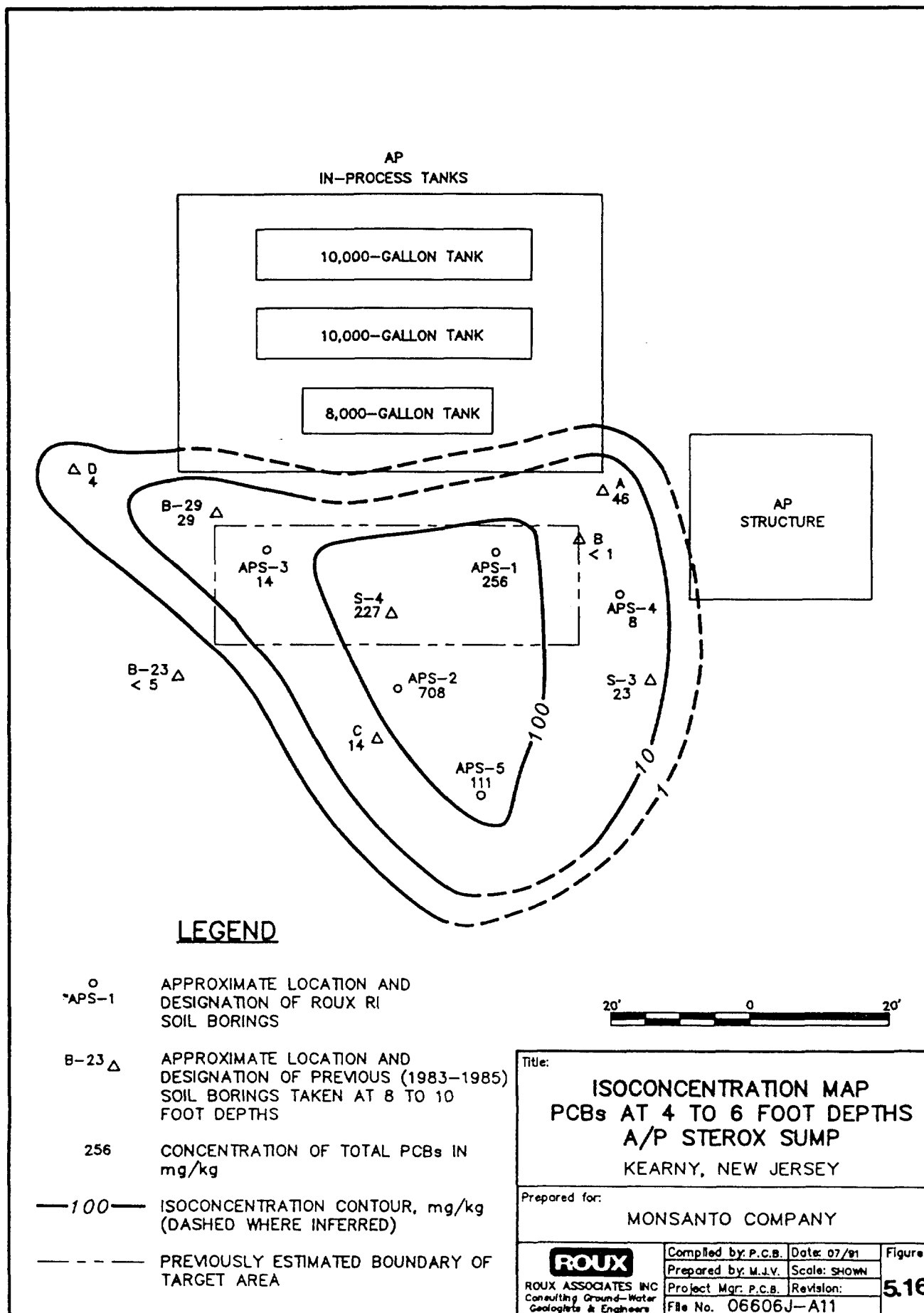


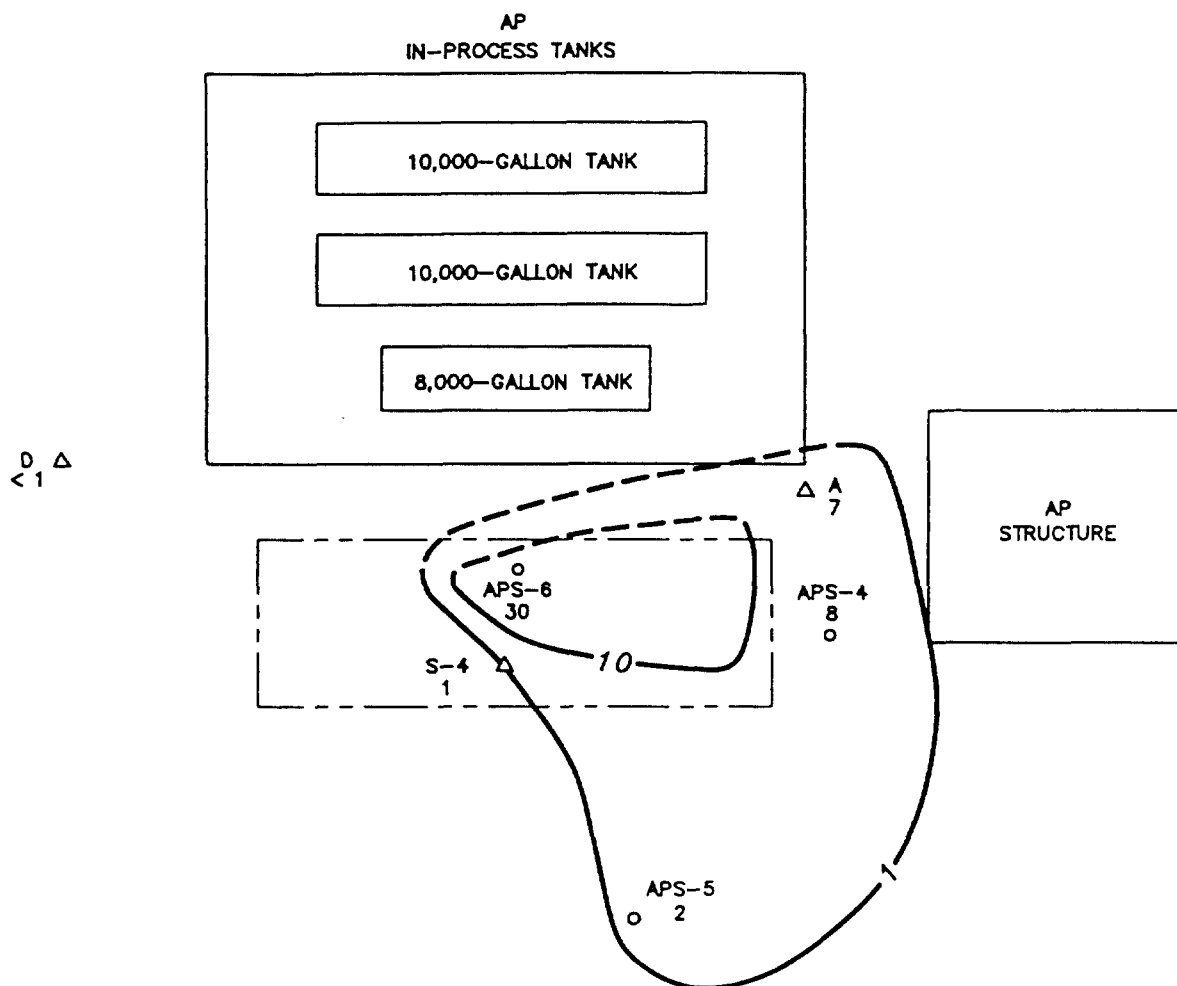
LEGEND

- APS-4 APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS
- 4 CONCENTRATION OF TOTAL VOLATILES
IN mg/kg
- 1 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - — PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA



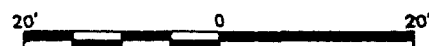
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| Title: | | | |
| ISOCONCENTRATION MAP
VOLATILE ORGANICS AT 9 TO 11
FOOT DEPTHS
AP/STEROX SUMP
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
|
ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: P.C.B. | Date: 07/91 | Figure
5.15 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A14 | | | |





LEGEND

- APS-4 APPROXIMATE LOCATION AND DESIGNATION OF ROUX RI SOIL BORINGS
- △ A APPROXIMATE LOCATION AND DESIGNATION OF PREVIOUS (1983-1985) SOIL BORINGS TAKEN AT 8 TO 10 FOOT DEPTHS
- 8 CONCENTRATION OF TOTAL PCBs IN mg/kg
- 10 — ISOCONCENTRATION CONTOUR, mg/kg (DASHED WHERE INFERRED)
- - - — PREVIOUSLY ESTIMATED BOUNDARY OF TARGET AREA



Title:

ISOCONCENTRATION MAP
PCBs AT 9 TO 11 FOOT DEPTHS
AP/STEROX SUMP
KEARNY, NEW JERSEY

Prepared for:

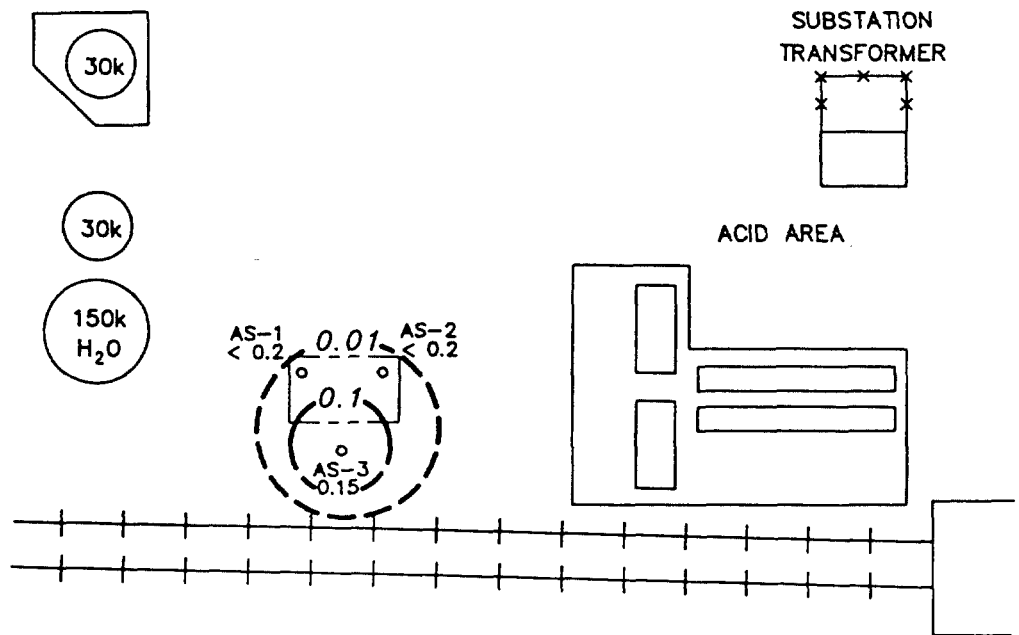
MONSANTO COMPANY

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 ROUX ASSOCIATES INC
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 Geologists & Engineers

| | |
|---------------------|--------------|
| Compiled by: P.C.B. | Date: 07/91 |
| Prepared by: M.I.V. | Scale: SHOWN |
| Project Mgr: P.C.B. | Revision: |
| File No. 06606J-A12 | |

Figure

5.17



LEGEND

- AS-1 APPROXIMATE LOCATION AND
DESIGNATION OF ROUX RI
SOIL BORINGS
- < 0.2 CONCENTRATION OF TOTAL PCBs IN
mg/kg
- 0.1 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- — — PREVIOUSLY ESTIMATED BOUNDARY OF
TARGET AREA

Title:

ISOCONCENTRATION MAP PCBs AT 4 TO 6 FOOT DEPTHS ACID SUMP

KEARNY, NEW JERSEY

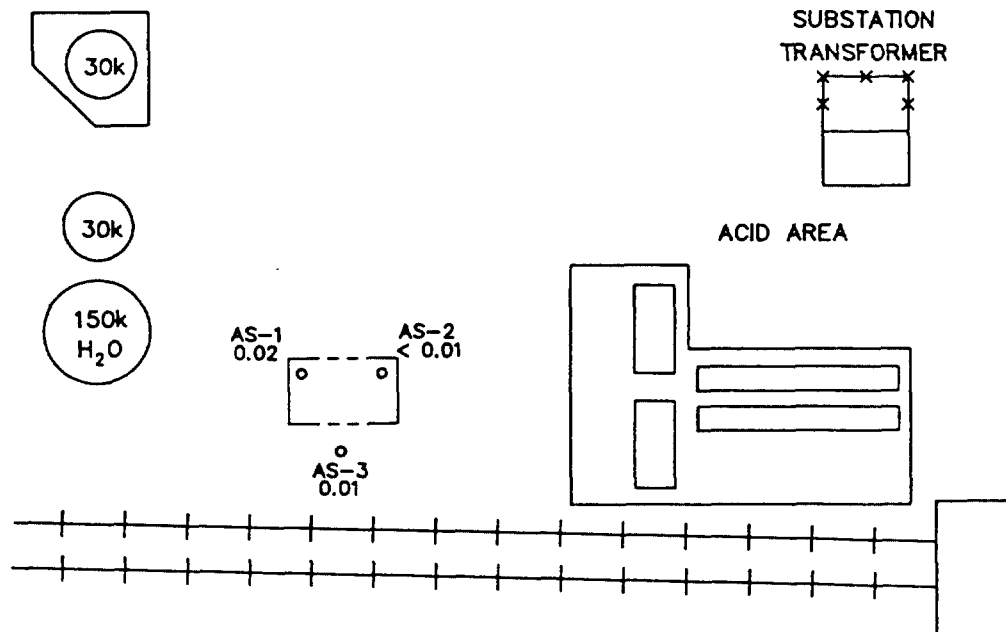
Prepared for:

MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

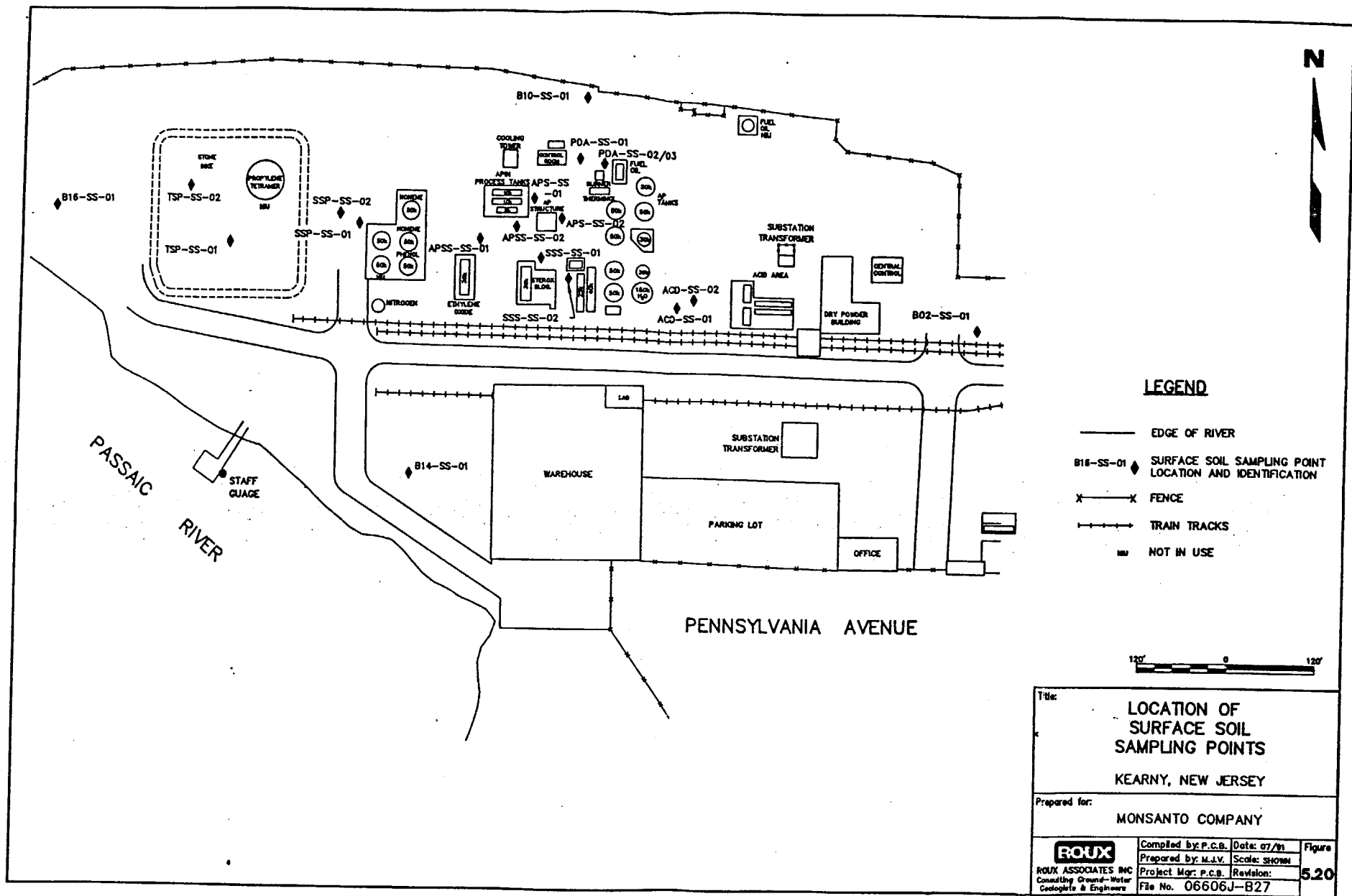
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| Compiled by: P.C.B. | Date: 06/01 | Figure |
| Prepared by: M.J.V. | Scale: SHOWN | |
| Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A19 | | 5.18 |

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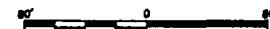


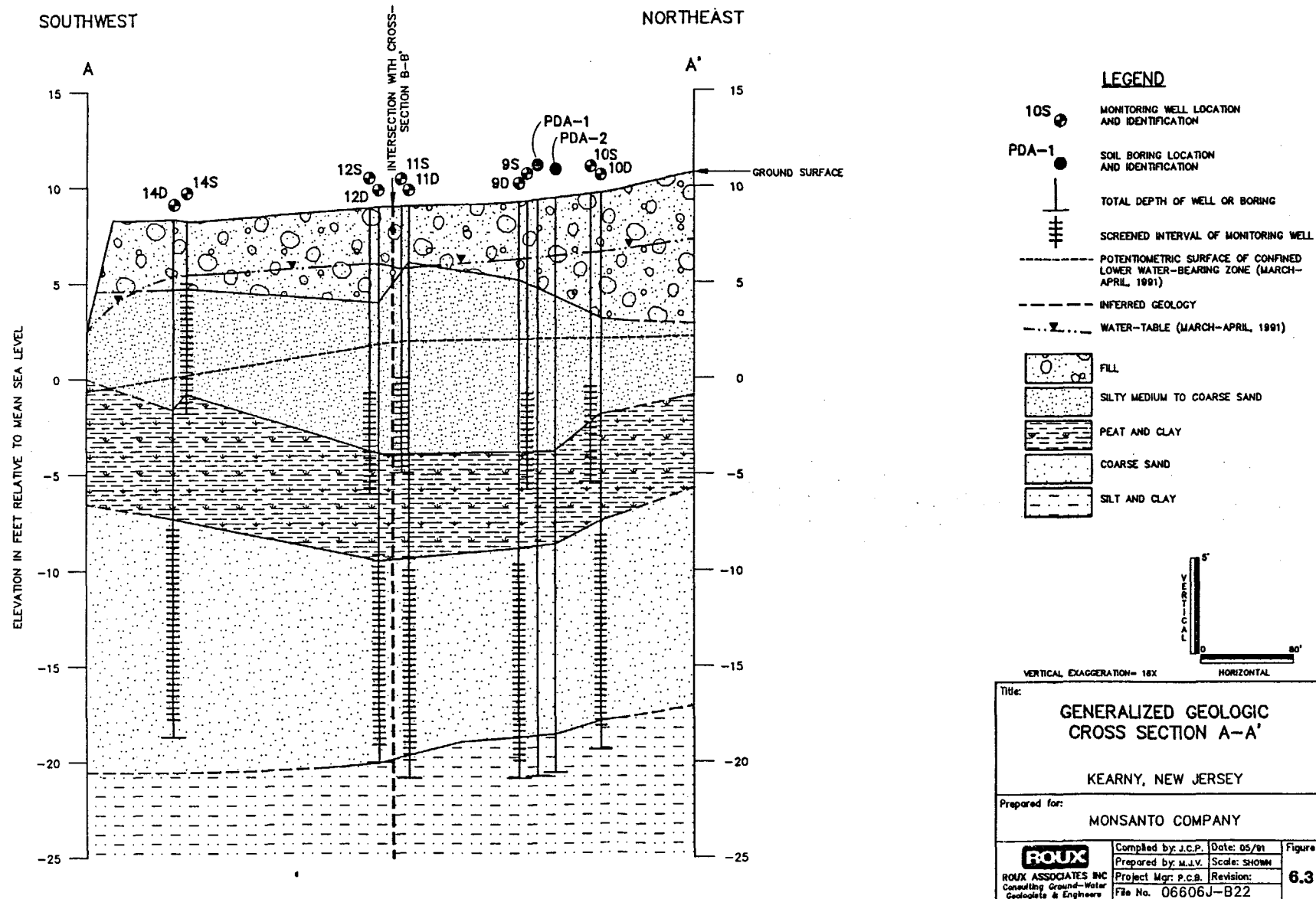
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| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | | | | Compiled by: P.C.B. Date: 07/91
Prepared by: M.J.V. Scale: SHOWN
Project Mgr: P.C.B. Revision:
File No. 06606J-A21 | Figure
5.19 |
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850130462

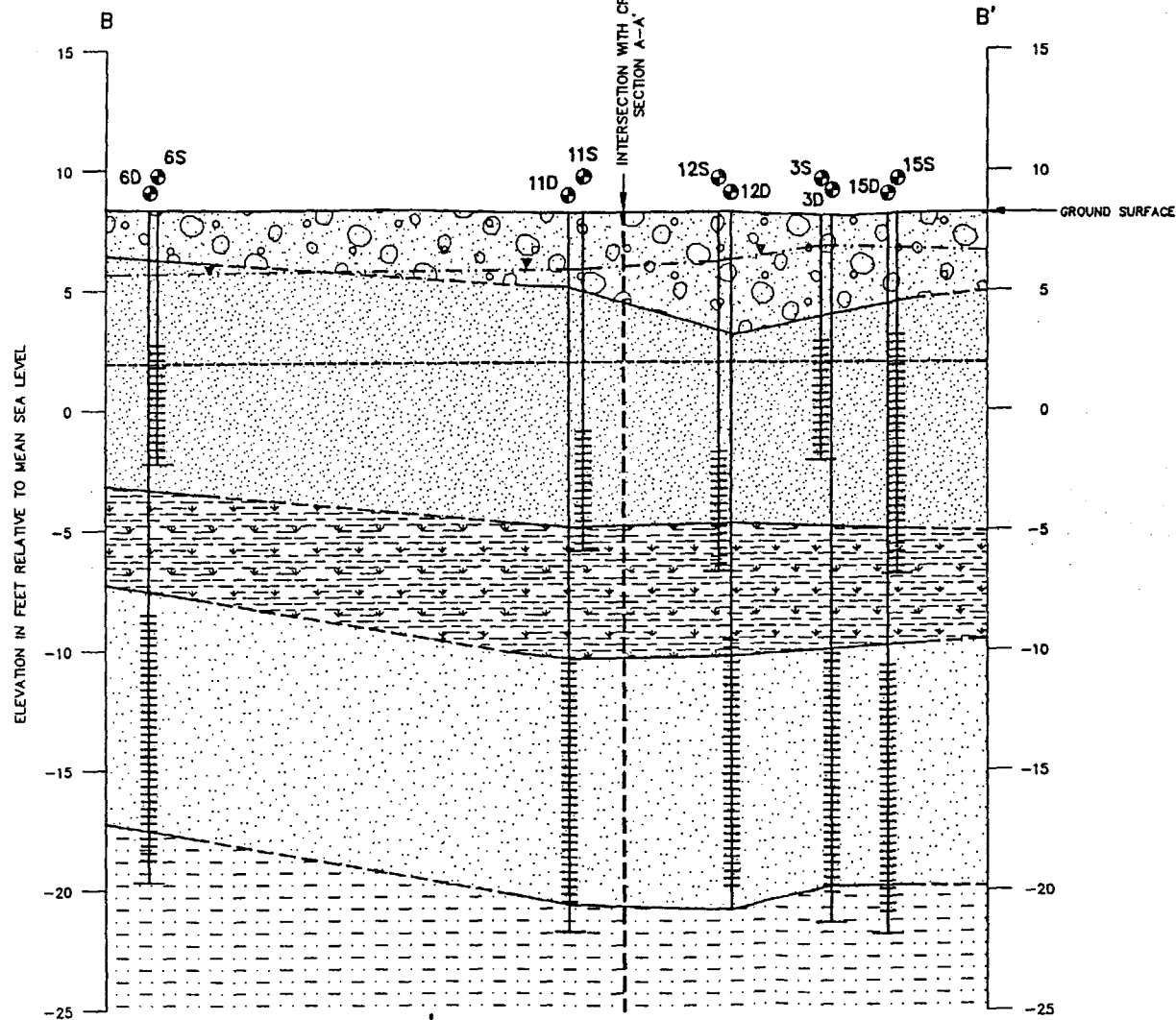




850130465

NORTHWEST

SOUTHEAST



LEGEND

- 10S ● MONITORING WELL LOCATION AND IDENTIFICATION
- TOTAL DEPTH OF WELL OR BORING
- SCREENED INTERVAL OF MONITORING WELL
- POTENTIOMETRIC SURFACE OF CONFINED LOWER WATER-BEARING ZONE (MARCH-APRIL 1991)
- INFERRED GEOLOGY
- WATER-TABLE (MARCH-APRIL 1991)
- FILL
- SILTY MEDIUM TO COARSE SAND
- ▨ PEAT AND CLAY
- ▨ COARSE SAND
- ▨ SILT AND CLAY

Title:

GENERALIZED GEOLOGIC
CROSS SECTION B-B'

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

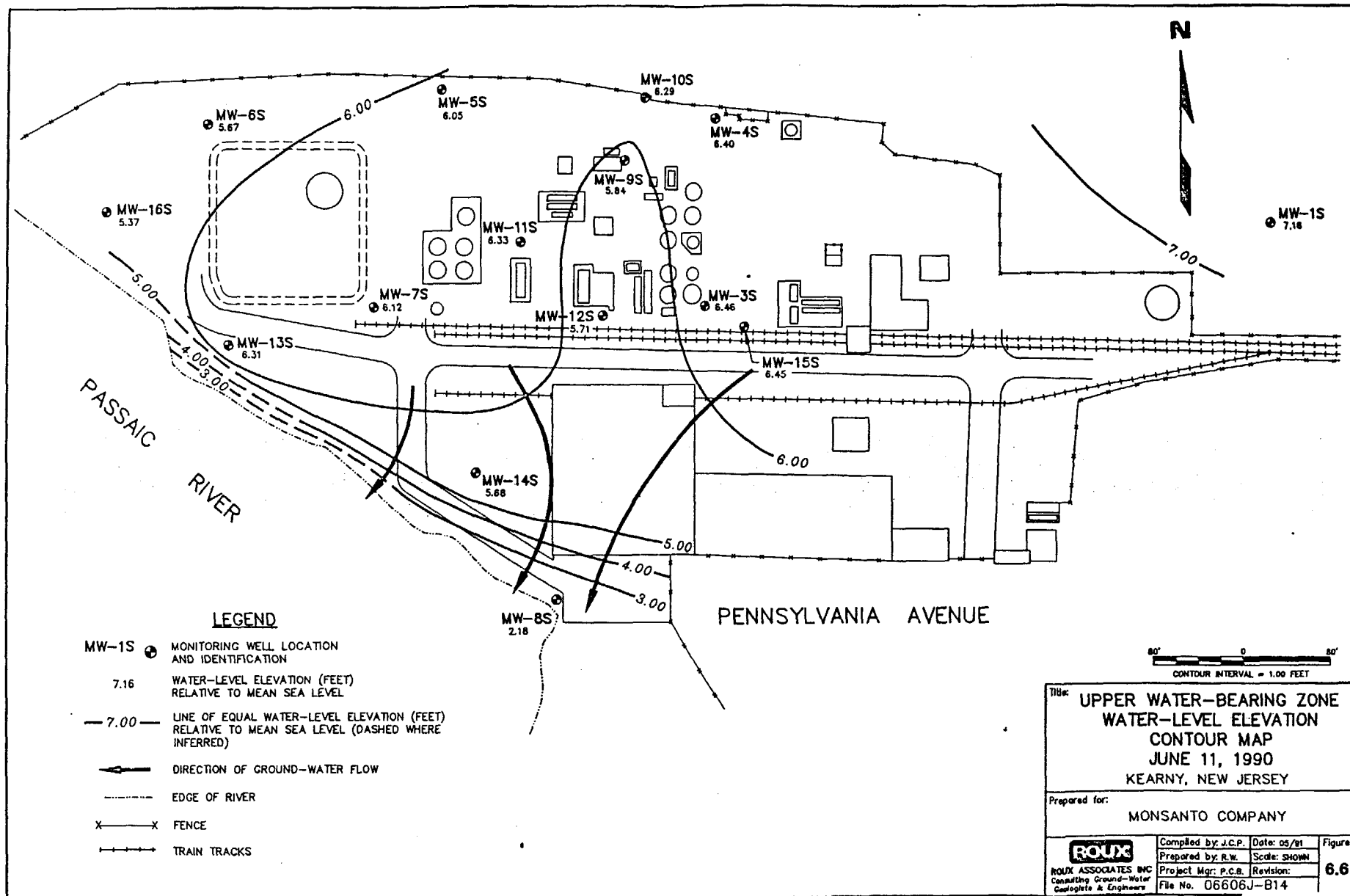
ROUX

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Consulting Ground-Water
Geologists & Engineers

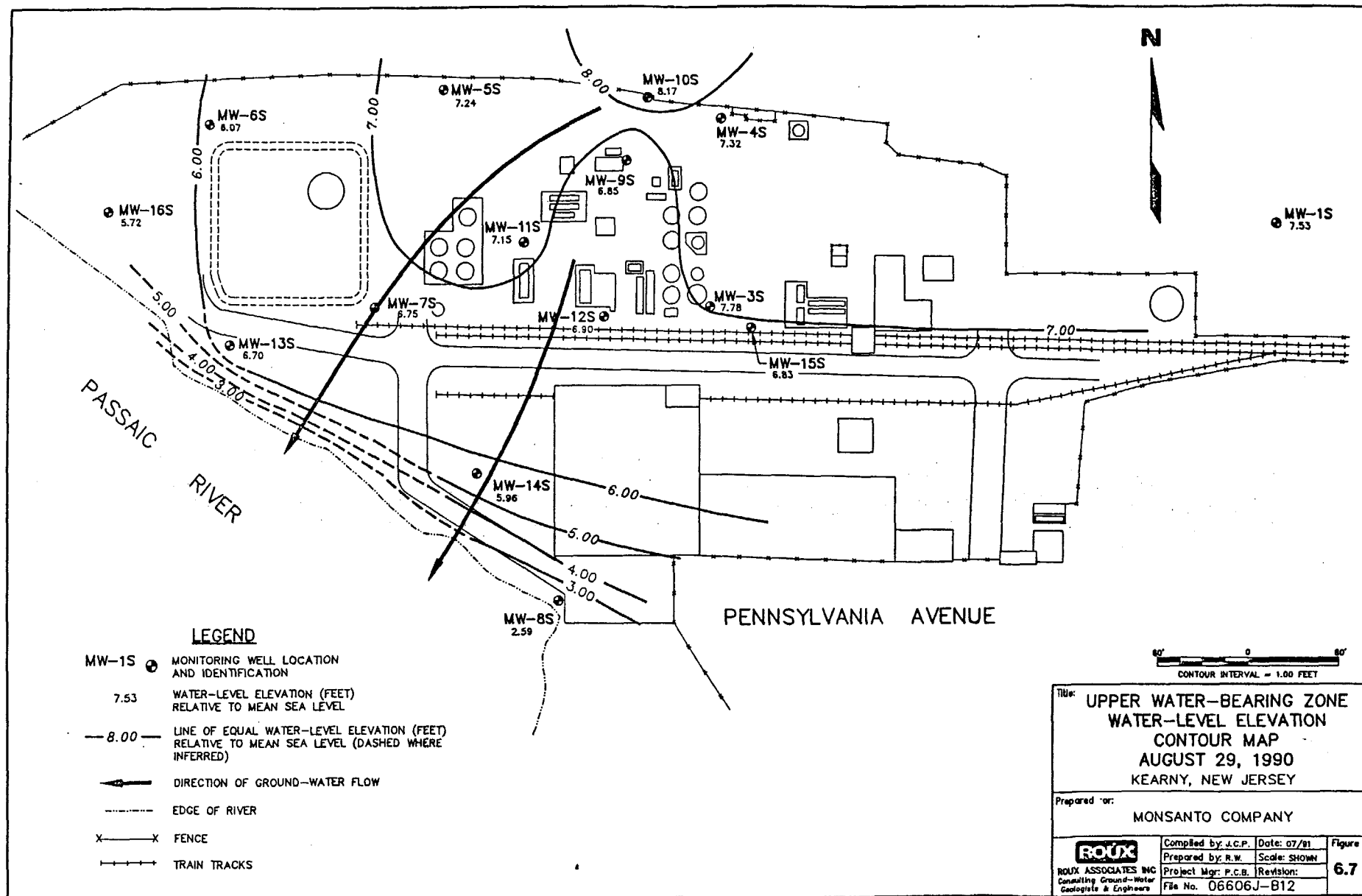
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| Compiled by: J.C.P. | Date: 05/91 | Figure |
| Prepared by: M.V. | Scale: SHOWN | |
| Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-B23 | | |

6.4

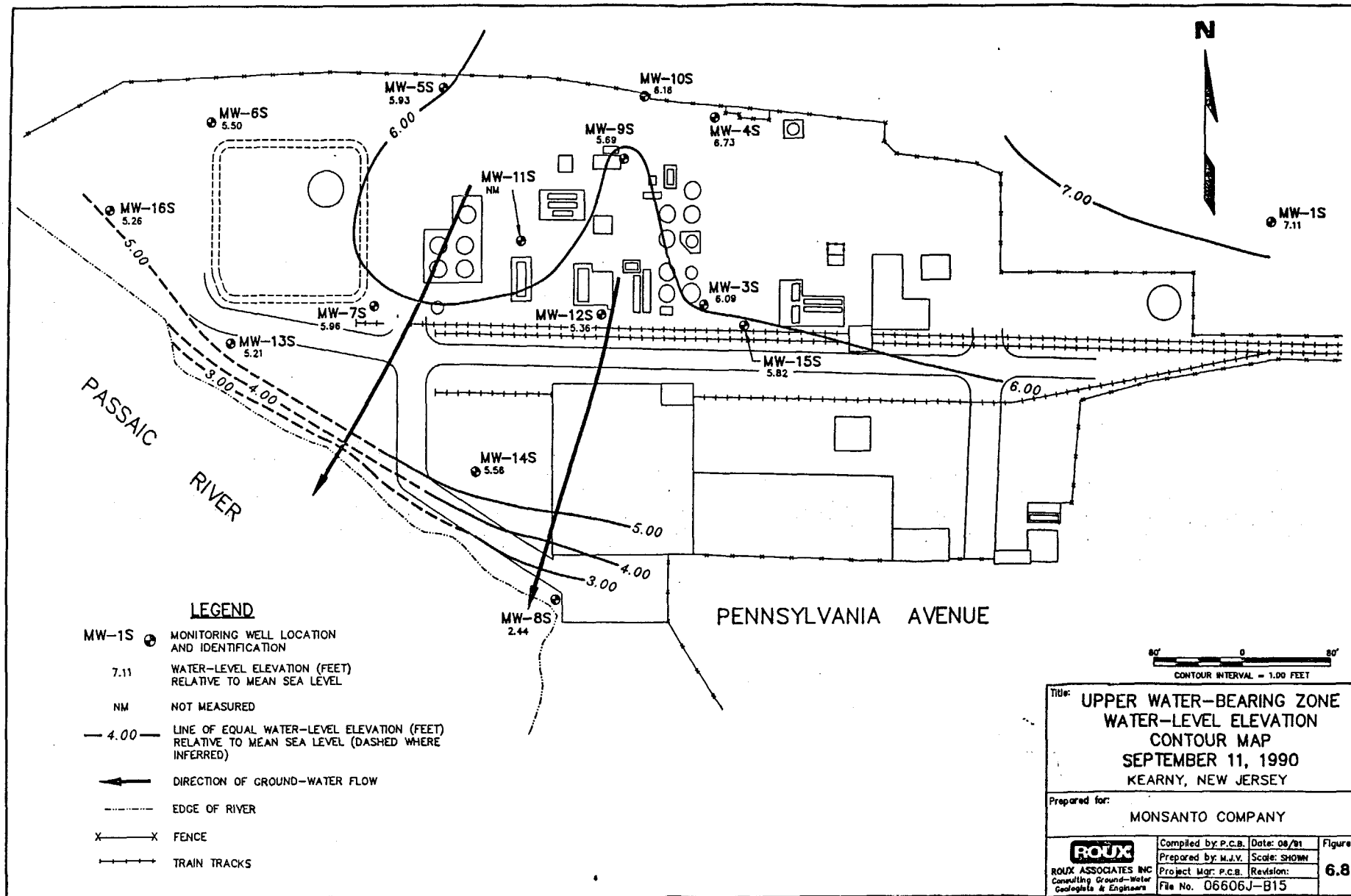
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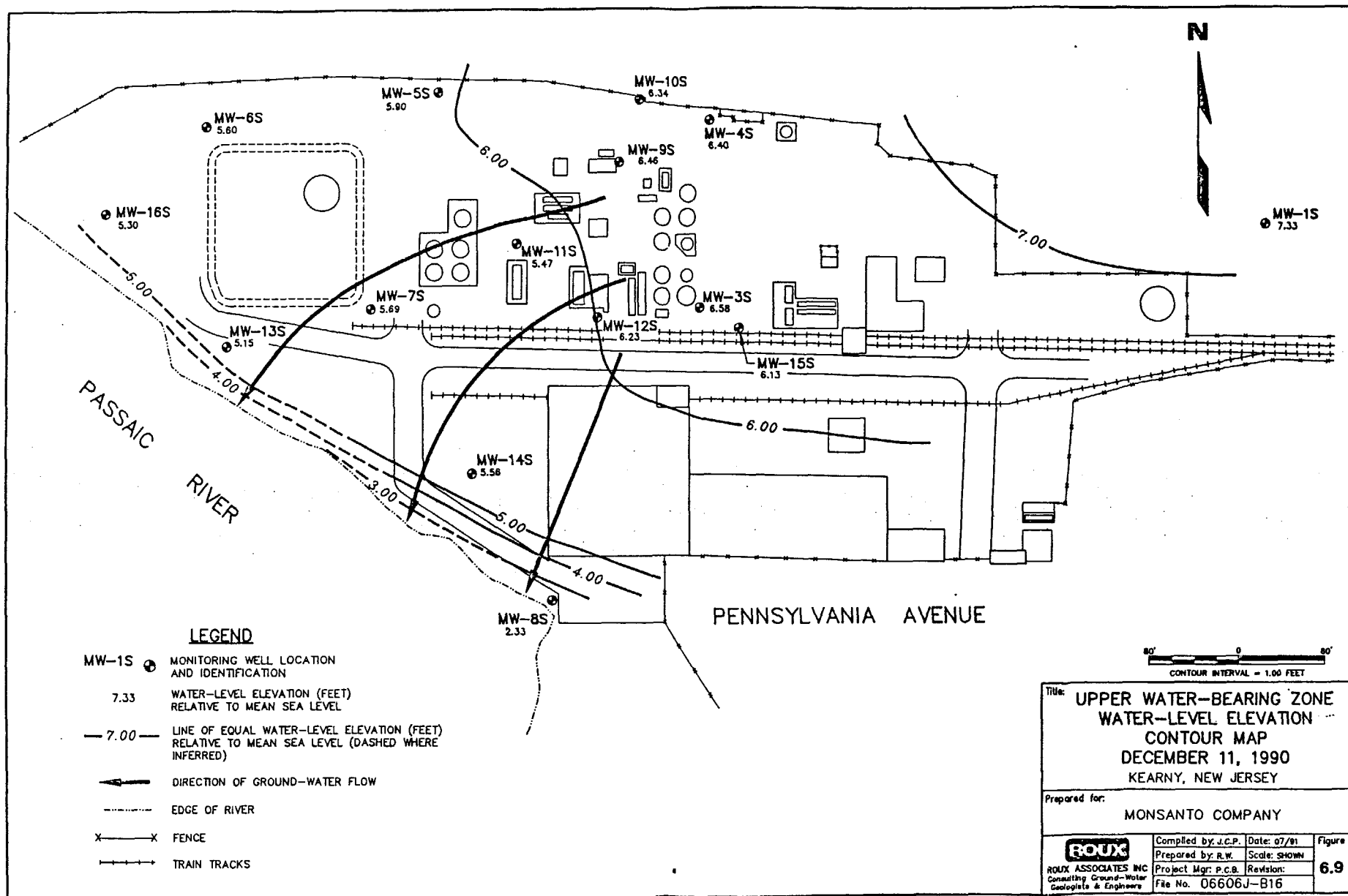
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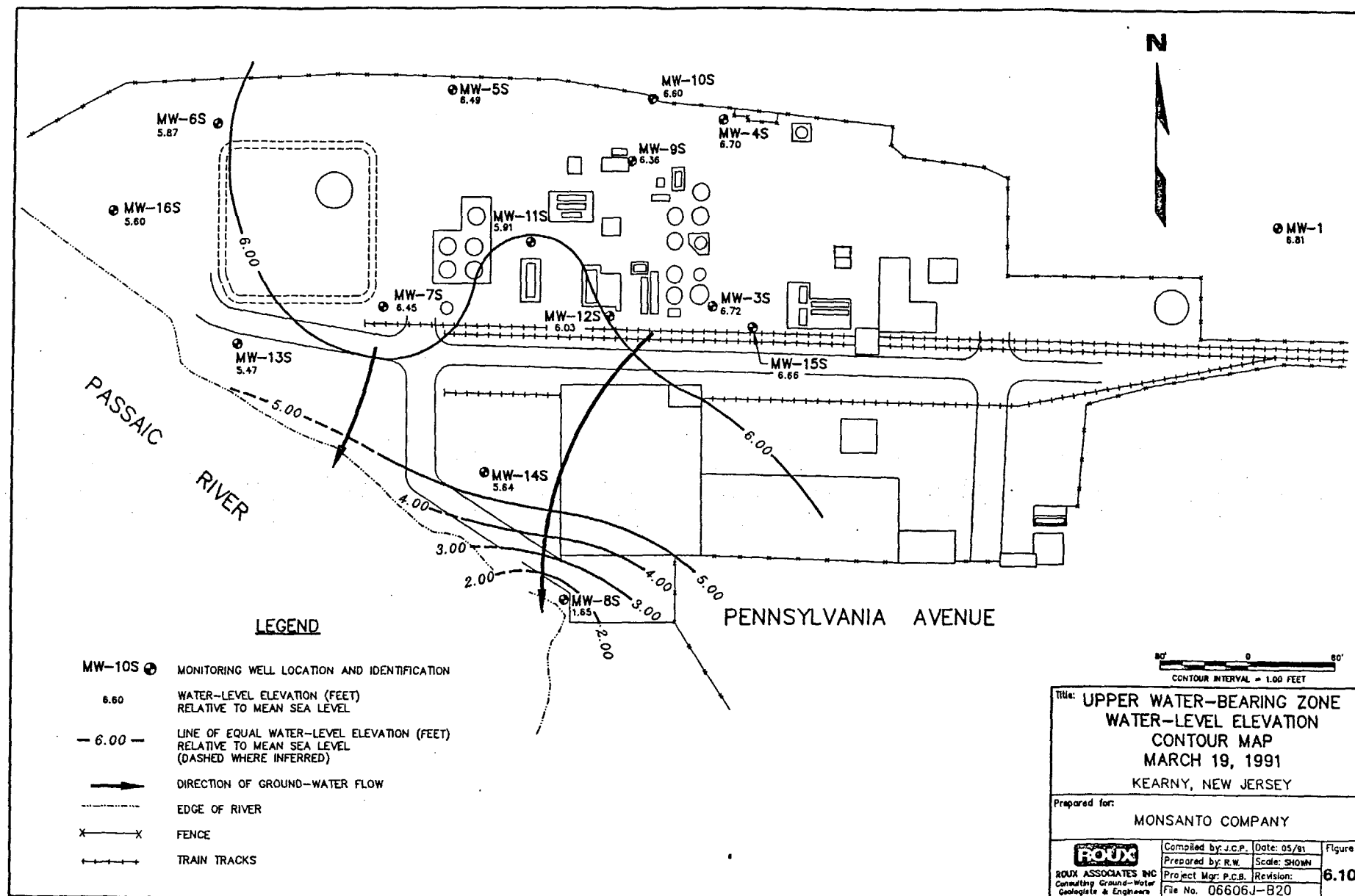
850130469



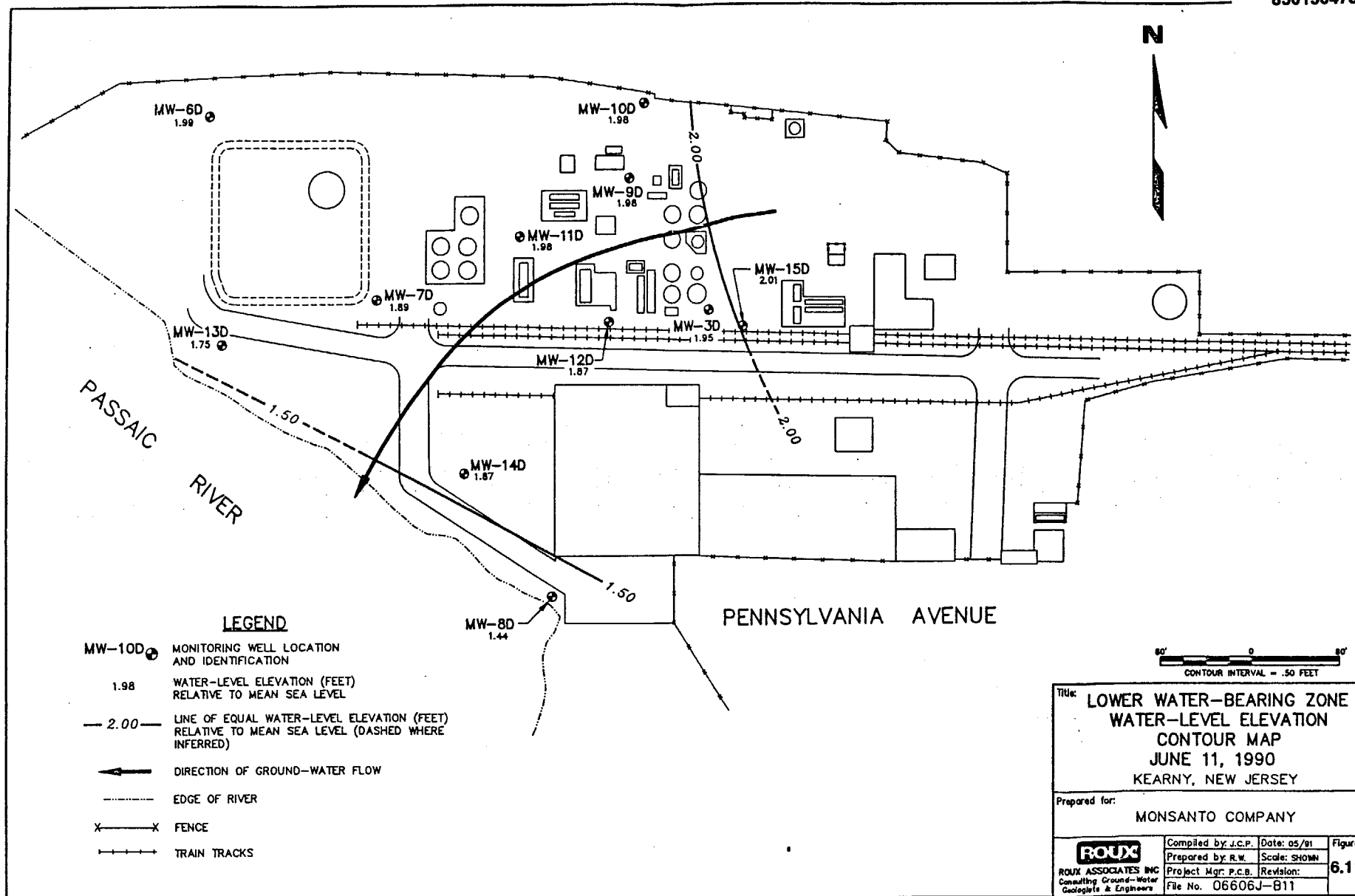
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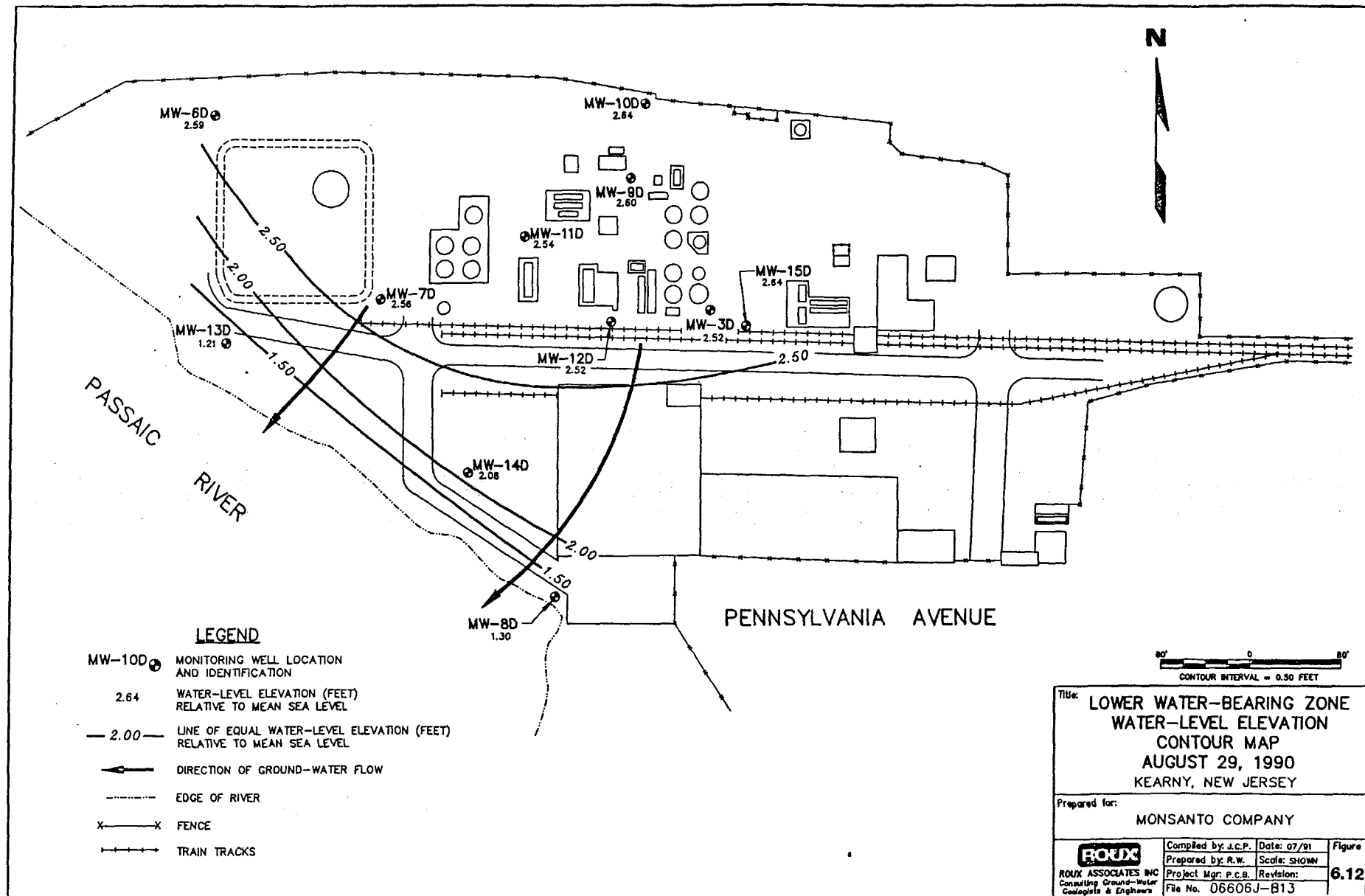


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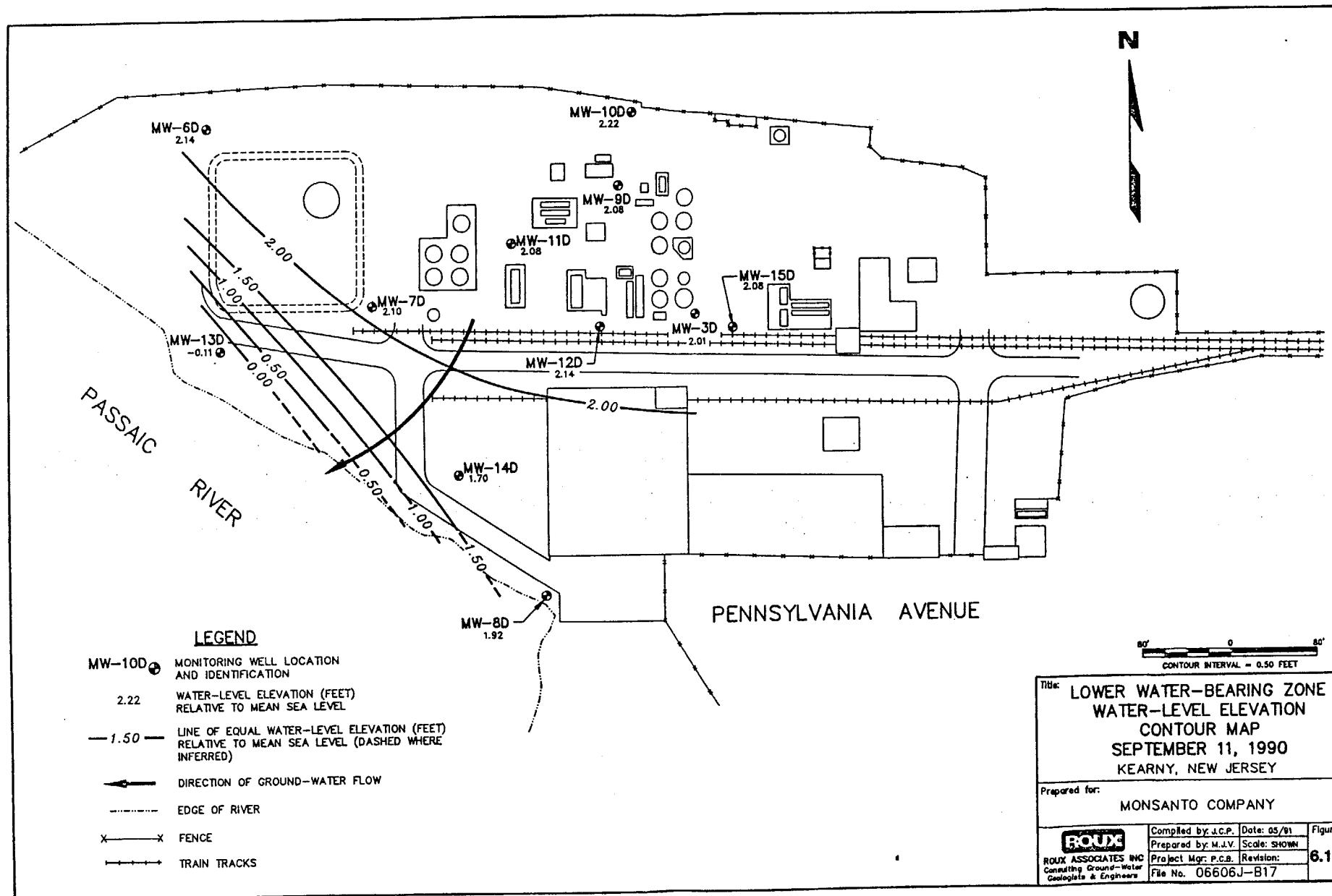


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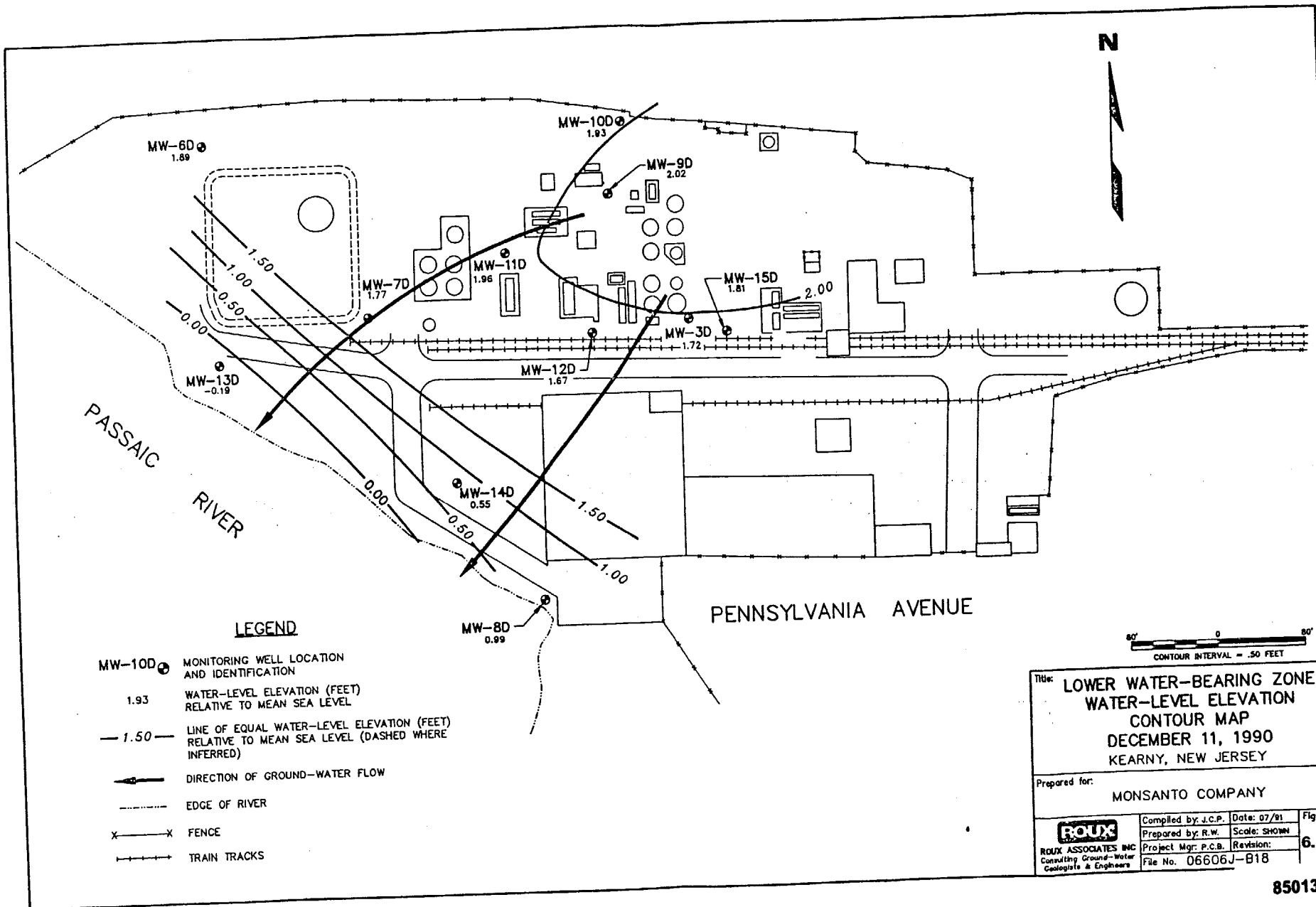




850130474

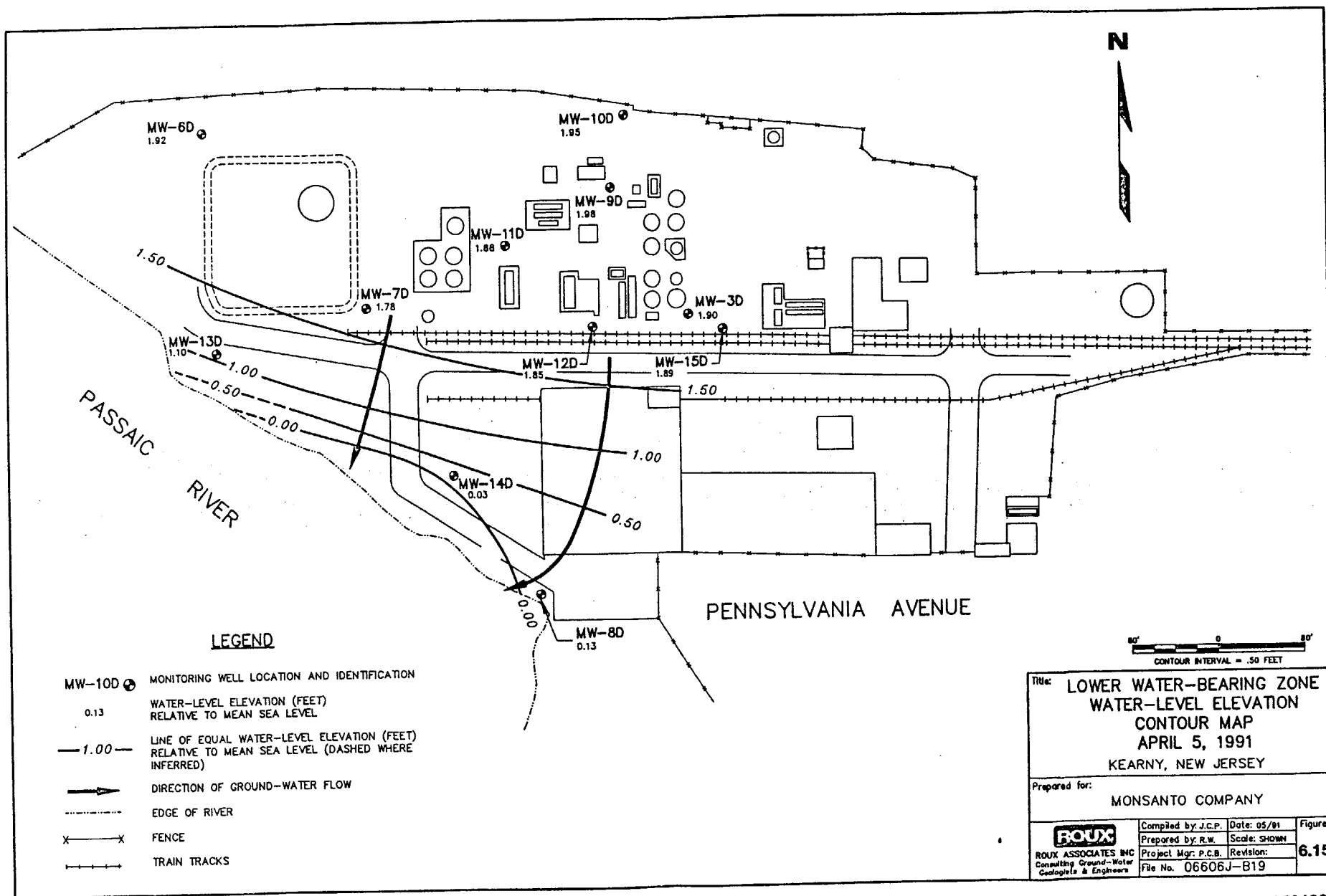


850130475



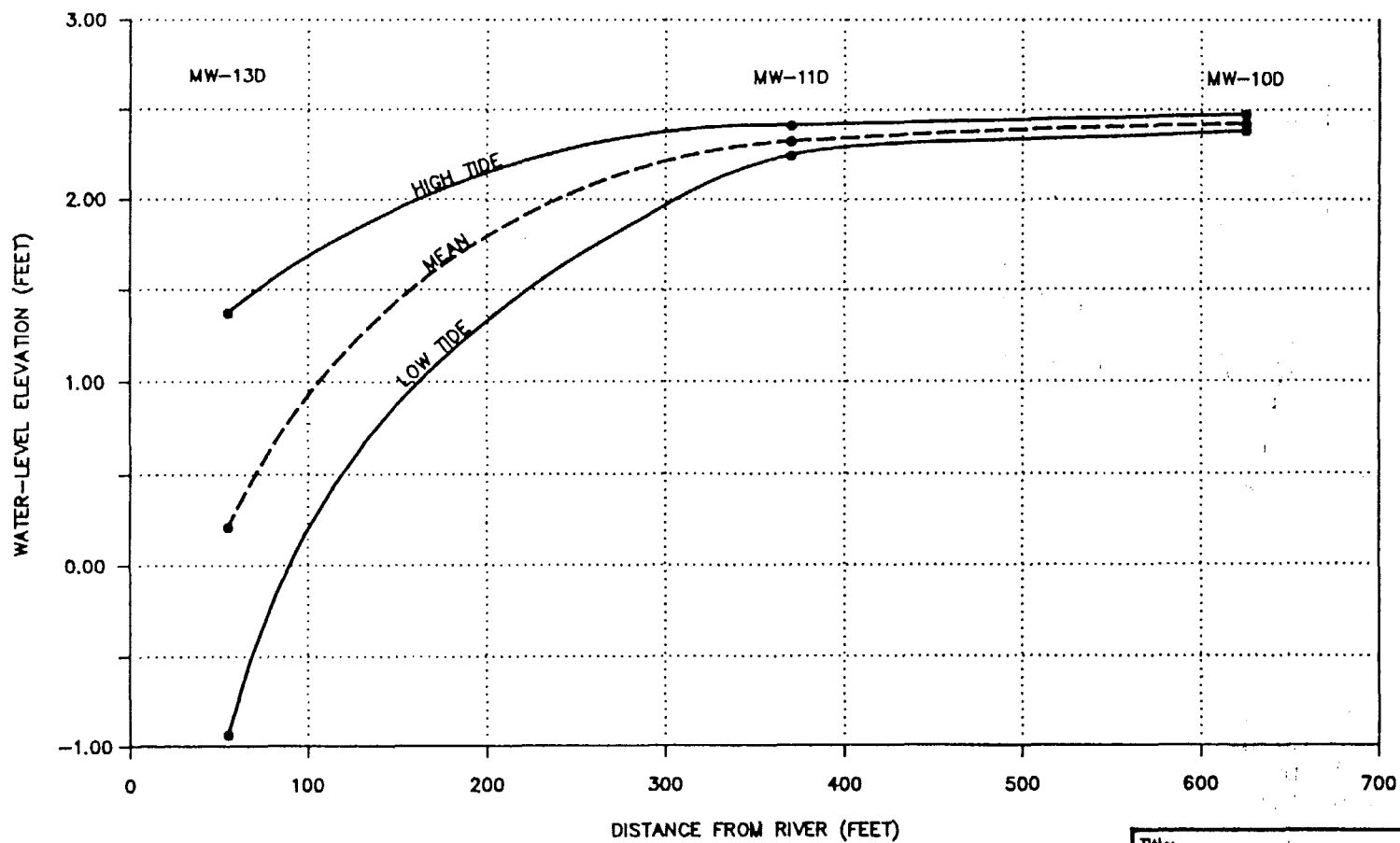
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| Title: LOWER WATER-BEARING ZONE
WATER-LEVEL ELEVATION
CONTOUR MAP
DECEMBER 11, 1990
KEARNY, NEW JERSEY | | | |
| Prepared for: MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC.
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.C.P. Date: 07/91
Prepared by: R.W. Scale: SHOWN
Project Mgr: P.C.B. Revision:
File No. 06606J-B18 | Figure
6.14 | |

850130476



| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|-----------------------|
| TITLE: LOWER WATER-BEARING ZONE
 WATER-LEVEL ELEVATION
 CONTOUR MAP
 APRIL 5, 1991
 KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers | Compiled by: J.C.P. | Date: 05/91 | Figure
6.15 |
| | Prepared by: R.W. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-B19 | | | |

850130477



Title: PLOT OF WATER LEVELS VS
DISTANCE FROM RIVER FOR
MW-10D, MW-11D, AND MW-13D
AUGUST 31, 1990
KEARNY, NEW JERSEY

Prepared for:
MONSANTO COMPANY

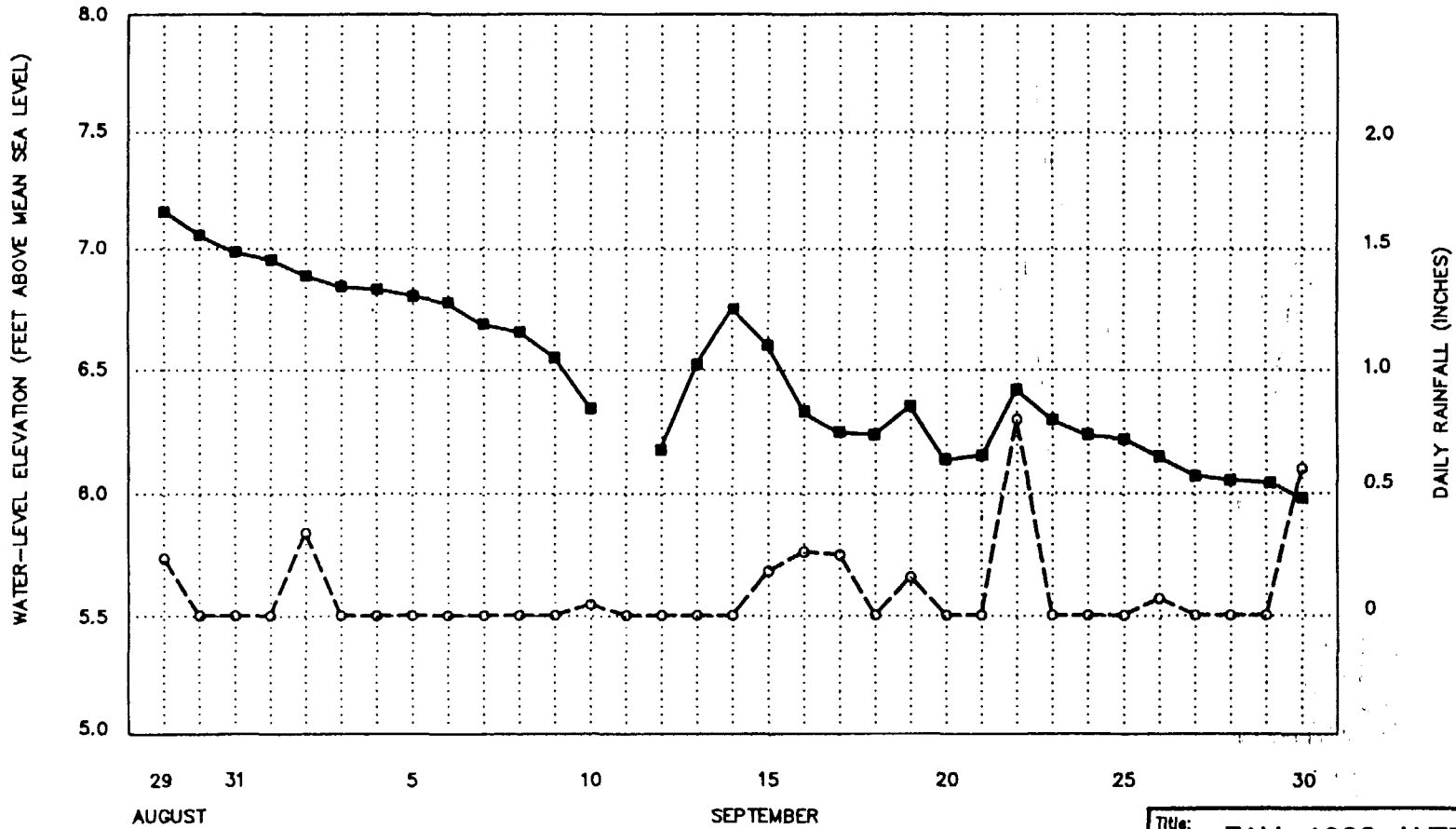
ROUX

ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

| | |
|---------------------|--------------|
| Compiled by: M.S.T. | Date: 08/91 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.C.B. | Revision: |
| File No. 06606J-A46 | |

Figure

6.16

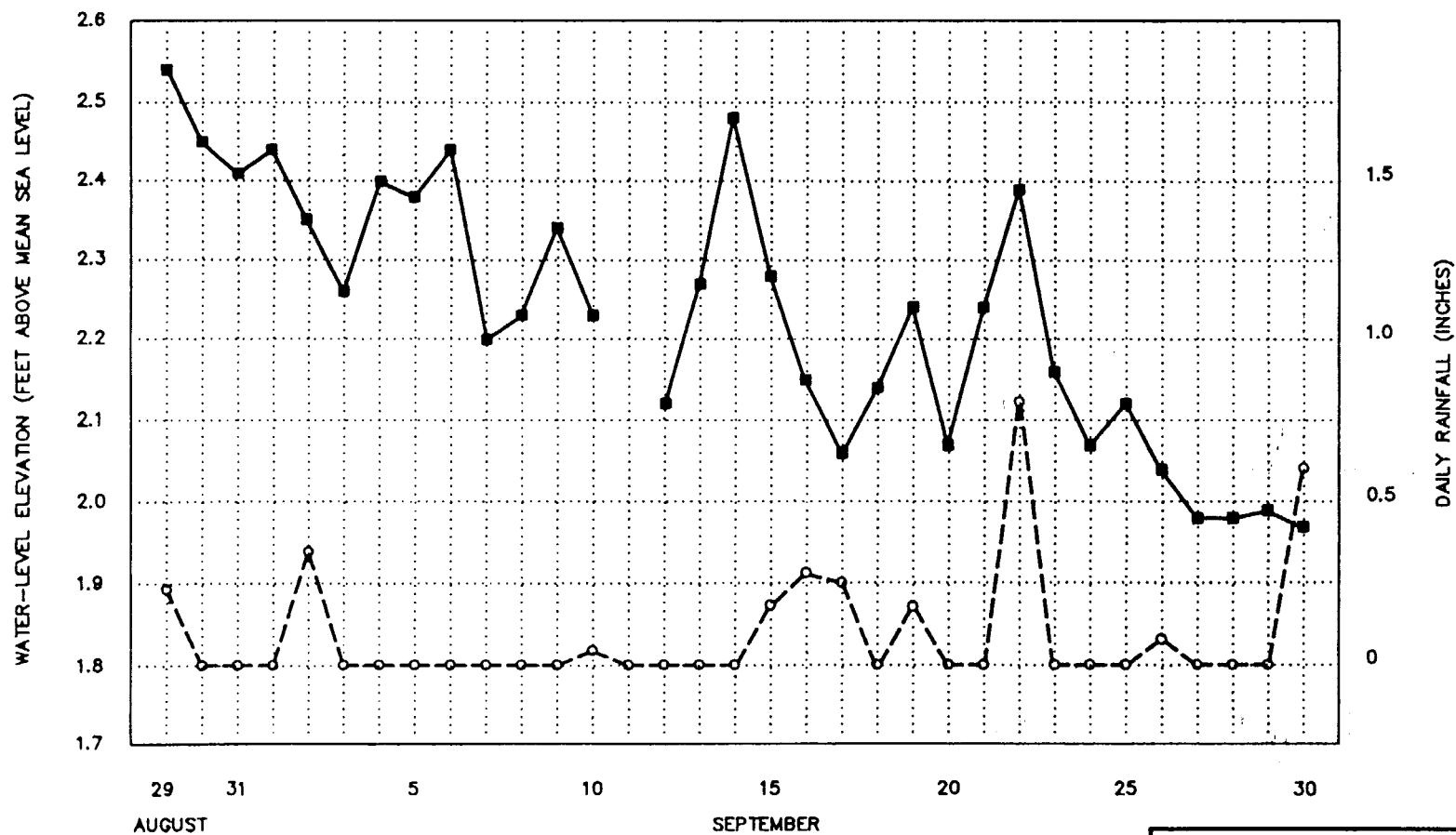


UPPER WATER-BEARING ZONE: MONITORING WELL MW-11S

LEGEND

- WATER-LEVEL ELEVATION
- DAILY RAINFALL

| | | | |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|-----------------------|
| Title: FALL 1990 AVERAGE DAILY WATER-LEVEL ELEVATION AND TOTAL RAINFALL MONITORING WELL MW-11S
KEARNY, NEW JERSEY | | | |
| Prepared for: MONSANTO COMPANY | | | |
| ROUX
<small>ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers</small> | Compiled by: J.P.O.
Prepared by: M.J.V.
Project Mgr: P.C.B. | Date: 07/91
Scale: SHOWN
Revision: | Figure
6.17 |
| File No. 06606J-A25 | | | |



LOWER WATER-BEARING ZONE: MONITORING WELL MW-11D

LEGEND

- WATER-LEVEL ELEVATION
 ○—○ DAILY RAINFALL

Title:

FALL 1990 AVERAGE DAILY
WATER-LEVEL ELEVATION
AND TOTAL RAINFALL
MONITORING WELL MW-11D

KEARNY, NEW JERSEY

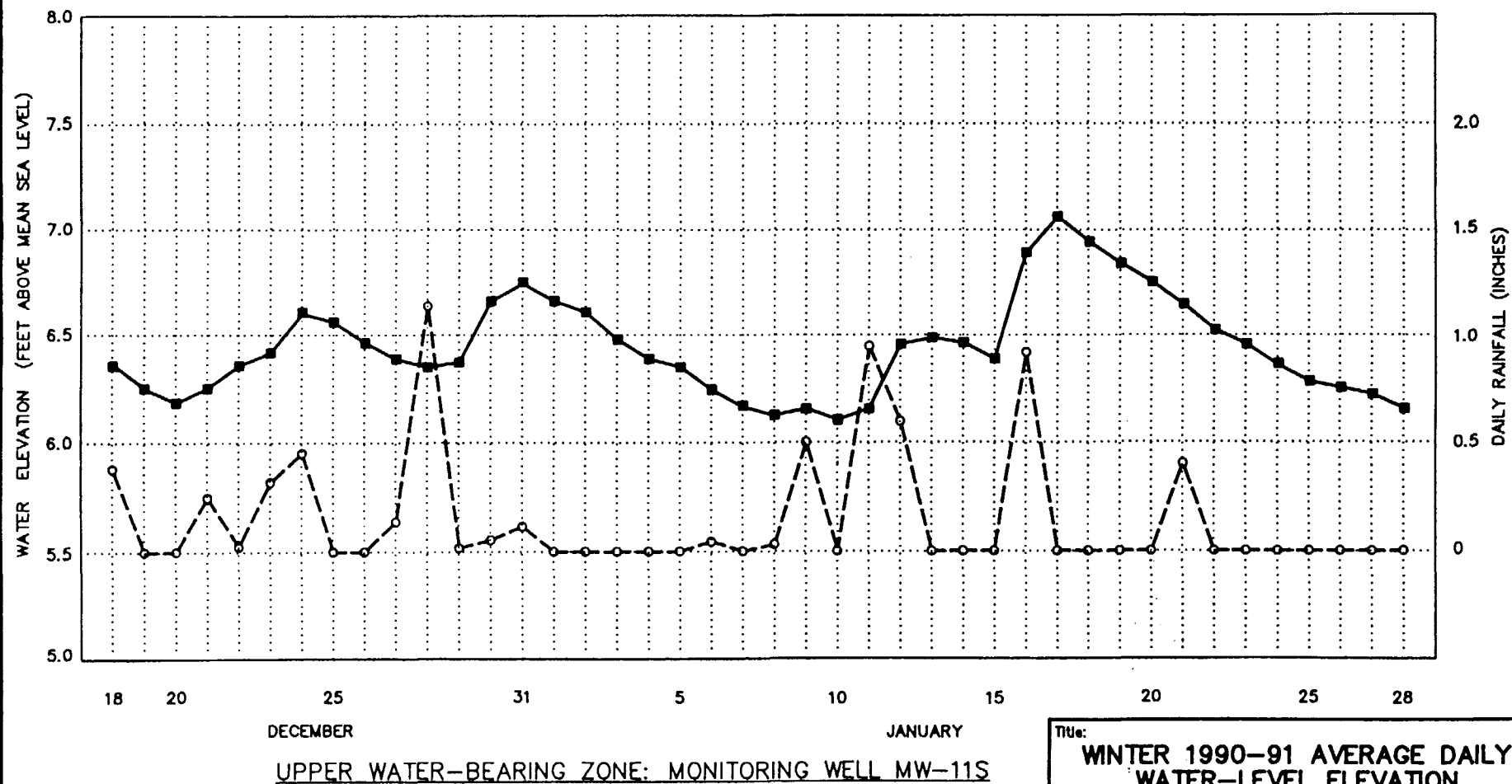
Prepared for:

MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

| | |
|---------------------|--------------|
| Compiled by: J.P.O. | Date: 07/91 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.C.B. | Revision: |
| File No. 06606J-A26 | |

Figure
6.18



LEGEND

- WATER-LEVEL ELEVATION
 ○—○—○ DAILY RAINFALL

Title: WINTER 1990-91 AVERAGE DAILY
 WATER-LEVEL ELEVATION
 AND TOTAL RAINFALL
 MONITORING WELL MW-11S
 KEARNY, NEW JERSEY

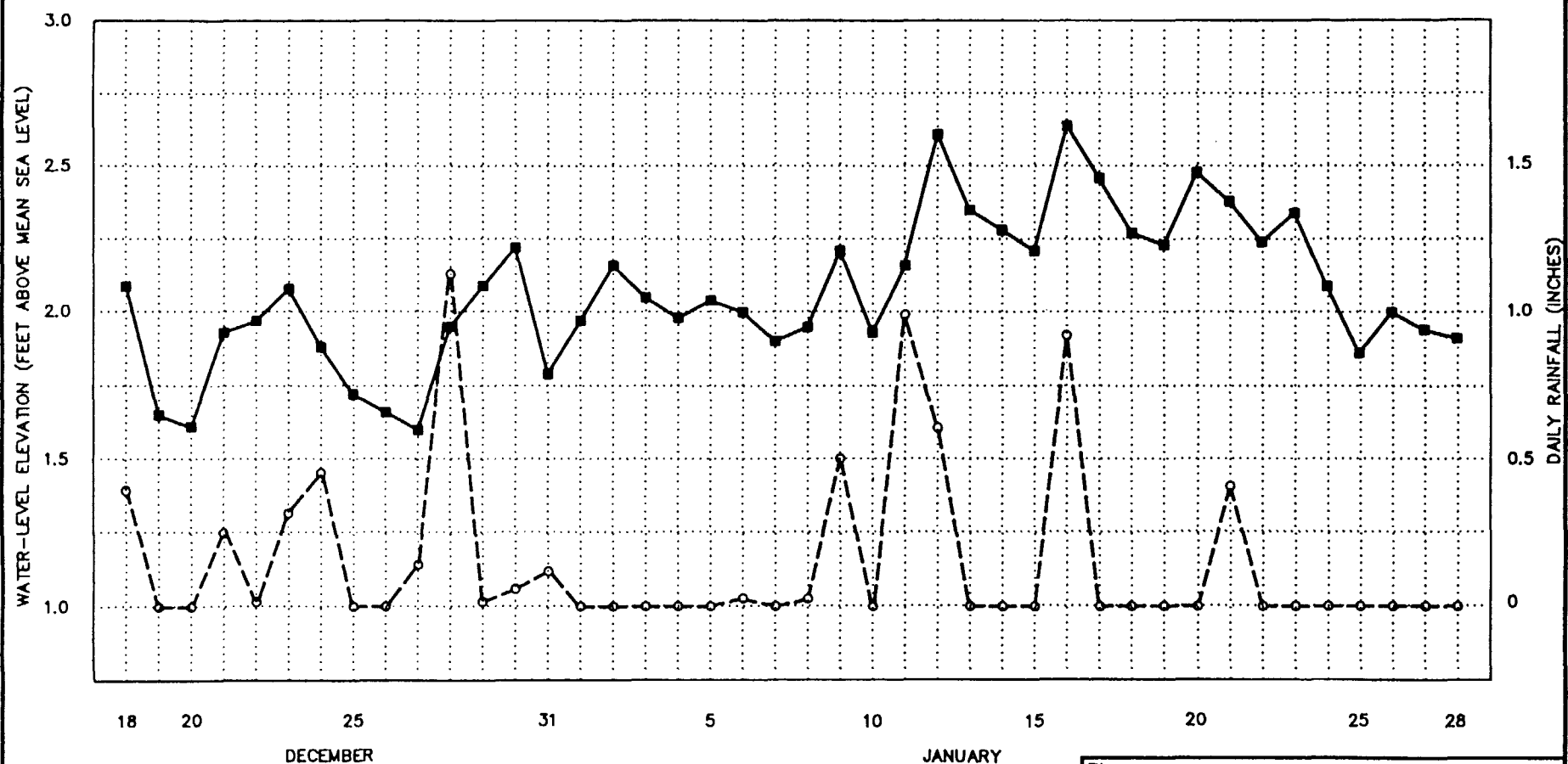
Prepared for:

MONSANTO COMPANY

ROUX
 ROUX ASSOCIATES INC
 Consulting Ground-Water
 Geologists & Engineers

Compiled by: J.P.O. Date: 07/91
 Prepared by: M.J.V. Scale: SHOWN
 Project Mgr: P.C.B. Revision:
 File No. 06606J-A27

Figure
6.19



LOWER WATER-BEARING ZONE: MONITORING WELL MW-11D

LEGEND

- WATER-LEVEL ELEVATION
- DAILY RAINFALL

Title: WINTER 1990-91 AVERAGE DAILY
WATER-LEVEL ELEVATION
AND TOTAL RAINFALL
MONITORING WELL MW-11D
KEARNY, NEW JERSEY

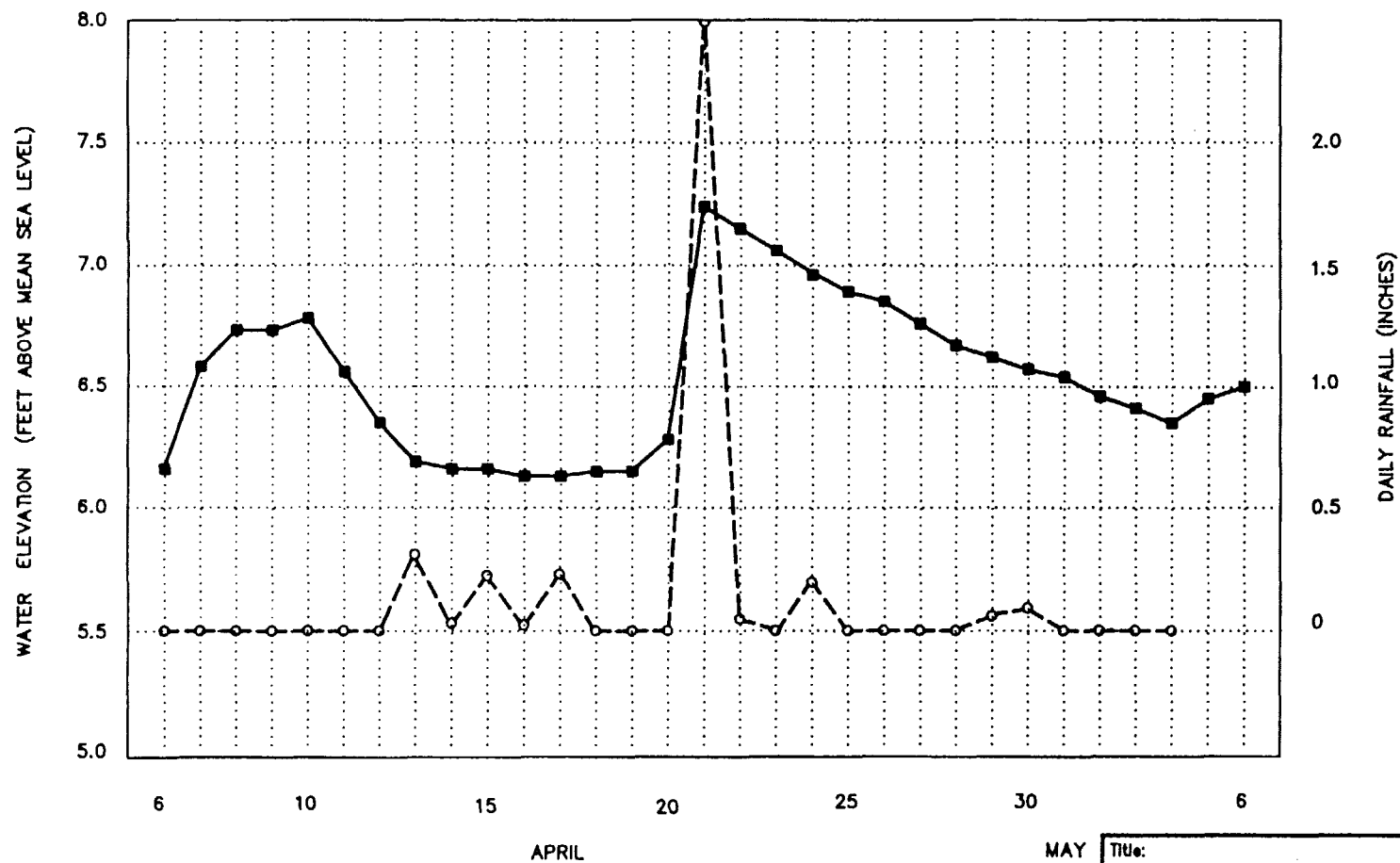
Prepared for:

MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

| | |
|---------------------|--------------|
| Compiled by: J.P.O. | Date: 07/91 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.C.B. | Revision: |
| File No. 06606J-A28 | |

Figure
6.20



UPPER WATER-BEARING ZONE: MONITORING WELL MW-11S

LEGEND

- WATER-LEVEL ELEVATION
- DAILY RAINFALL

Title: **SPRING 1991 AVERAGE DAILY
WATER-LEVEL ELEVATION
AND TOTAL RAINFALL
MONITORING WELL MW-11S
KEARNY, NEW JERSEY**

Prepared for:

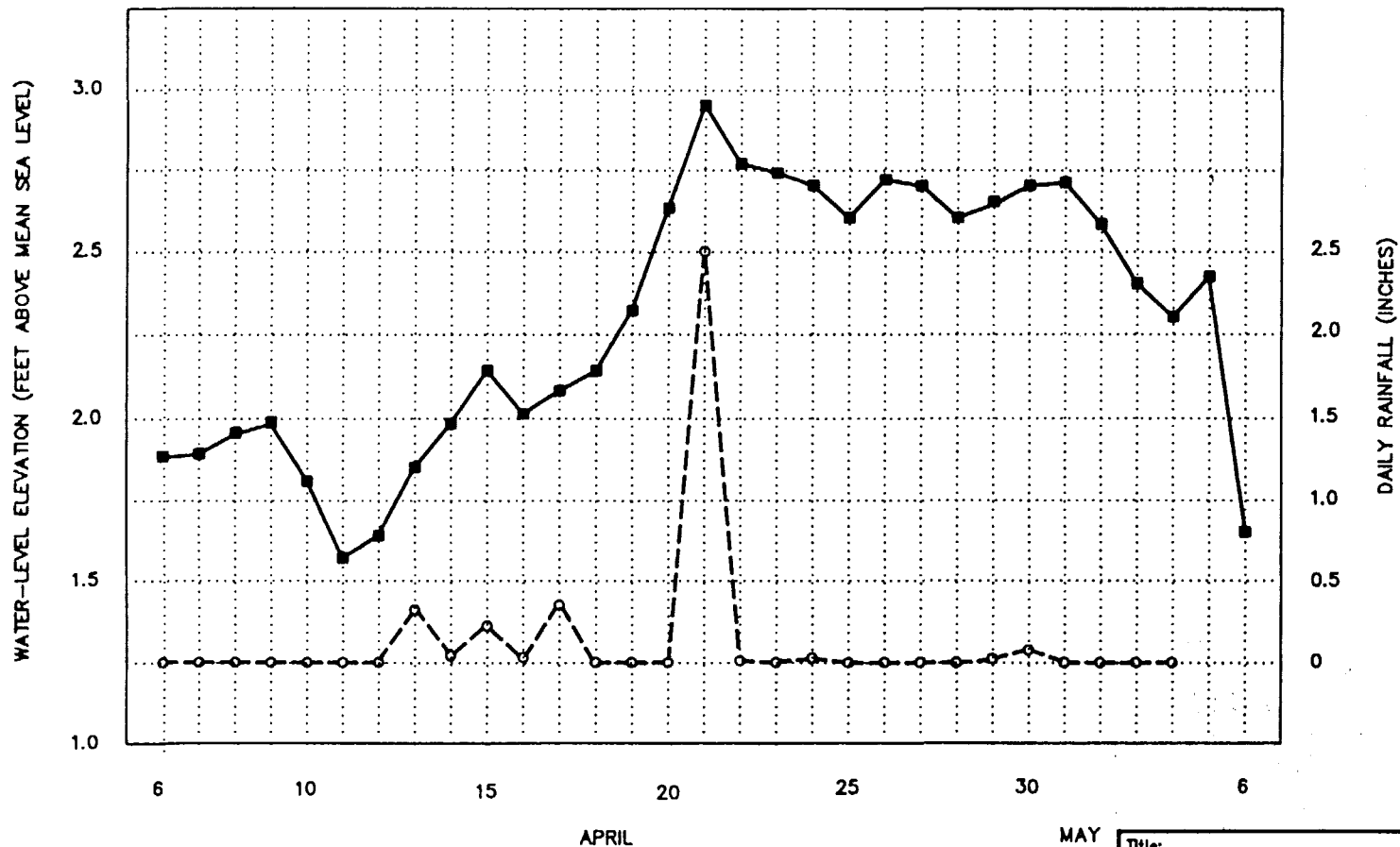
MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Consulting Ground-Water
Geologists & Engineers

| | |
|---------------------|--------------|
| Compiled by: J.P.O. | Date: 07/91 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.C.B. | Revision: |
| File No. 06606J-A29 | |

Figure
6.21

850130483



LOWER WATER-BEARING ZONE: MONITORING WELL MW-11D

LEGEND

- WATER-LEVEL ELEVATION
- DAILY RAINFALL

| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------|
| Title:
SPRING 1991 AVERAGE DAILY
WATER-LEVEL ELEVATION
AND TOTAL RAINFALL
MONITORING WELL MW-11D
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
<small>ROUX ASSOCIATES INC
 Consulting Ground-Water
 Geologists & Engineers</small> | Compiled by: J.P.O.
Prepared by: M.J.V.
Project Mgr: P.C.B.
File No. 06606J-A30 | Date: 07/91
Scale: SHOWN
Revision:
 | Figure
6.22 |

Exhibit C

2

PRELIMINARY REMEDIAL INVESTIGATION REPORT
Volume II of III

MONSANTO KEARNY PLANT
Kearny, New Jersey

August 30, 1991

Prepared for:

MONSANTO COMPANY
Kearny, New Jersey

Prepared by:

ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066



APPENDIX A

Geologic Logs.

APPENDIX A-1
Geologic Logs - Phase I Wells.

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>7D</u>
Study No. _____ Date <u>5/4/90 and 5/5/90</u>
Project <u>00606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/4/90</u> Ended <u>5/5/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17</u>
Screen Interval (ft.) <u>17 - 27</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change & Gen. Desc. | Depth (ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|----------------------|----------------------------|-------------|------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.25 | 0-2 | 5-3-2-1 | | 0 | Black gravelly fill, wet. |
| 10.0 ppm | 2 | 0.3 | 2-4 | 1-1-2-2 | Fill Material | 2 | Organic odor present. |
| 70.0 ppm | 3 | 0.6 | 4-6 | 1-3-4-4 | | 4 | Organic odor present. |
| 3.0 ppm | 4 | 2.0 | 6-8 | 4-4-4-5 | Medium Sand | 6 | 5- Red-brown medium sand, organic odor present, wet. |
| 29.0 ppm | 5 | 1.8 | 8-10 | 5-6-4-4 | | 8 | Gray-brown silty medium sand, wet. |
| 29.0 ppm | 6 | 1.0 | 10-12 | 1-3-2-3 | | 10 | Red-brown medium sand, wet. |
| 0.0 ppm | 7 | 2.0 | 12-14 | 3-Weight of Hammer-1 | | 12 | 11.5- Peat, wet. OVM = 8.0 ppm. |
| 0.0 ppm | 8 | 2.0 | 14-16 | 2-3-3-5 | Peat | 14 | |
| 0.0 ppm | 9 | 2.0 | 16-18 | 5-6-10-10 | | 16 | 17- Gray silty fine to medium sand, wet. |
| 0.0 ppm | 10 | 1.7 | 18-20 | 15-14-13-16 | | 18 | 19.5- Red-brown medium to coarse sand with silt and gravel, wet. |
| 0.0 ppm | 11 | 1.2 | 20-22 | 5-6-6-5 | Sand | 20 | |
| 0.0 ppm | 12 | 1.5 | 22-24 | 5-8-8-8 | | 22 | |
| 0.0 ppm | 13 | 1.7 | 24-26 | 8-7-9-6 | Silt and Clay | 24 | 25.5- Gray silt and varved clay, wet. |
| | | | | | | 26 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130489

MO06606J.4.1 8.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>8D</u>
Study No. _____ Date <u>5/2/90 and 5/3/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/3/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17</u>
Screen Interval (ft.) <u>17 - 27</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|------------|-------------------------------|----------------|--------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.2 ppm | 1 | 1.0 | 0-2 | 11-20-11-7 | Fill Material and Sand | | Black to gray fill material with gravel. |
| 0.2 ppm | 2 | 0.9 | 2-4 | 5-4-3-4 | | 2 | Gray clayey fill material with gravel, concrete, and brick debris, wet. |
| 0.2 ppm | 3 | 1.6 | 4-6 | 4-4-3-2 | | 4 | Grayish brown fill material with gravel, concrete and brick debris, wet. |
| 0.2 ppm | 4 | 1.7 | 6-8 | 2-1-1-2 | | 6 | |
| 0.0 ppm | 5 | 1.3 | 8-10 | 1-1-1-2 | Peat | 8 | 7.3 - Peat, wet. |
| 0.0 ppm | 6 | 1.5 | 10-12 | 1-2-2-1 | | 10 | |
| 0.0 ppm | 7 | 0 | 12-14 | 2-3-2-2 | | 12 | No recovery. |
| 0.0 ppm | 8 | 1.7 | 14-16 | 0-2-3-6 | | 14 | |
| 0.0 ppm | 9 | 1.7 | 16-18 | 7-6-5-6 | | 16 | 14.5 - brown fine sand with silt, wet. |
| 2.0 ppm | 10 | 1.5 | 18-20 | 5-3-5-6 | Sand and Silt | 18 | Grayish brown fine sand with silt, very faint organic odor, wet. |
| 0.0 ppm | 11 | 1.0 | 20-22 | 4-3-4-8 | | 20 | Grayish brown medium to coarse sand with silt, wet. |
| 0.0 ppm | 12 | 2.0 | 22-24 | 3-6-7-11 | | 22 | |
| 0.0 ppm | 13 | 2.0 | 24-26 | 5-5-10-11 | | 24 | 25.8 - Gray fine sand. |
| | | | | | | 26 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130490

MO06606J.3.58 8.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>9D</u>

Study No. _____ Date <u>5-15-90 & 5/16/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/15/90</u> Ended <u>5/16/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and mud rotary</u> | WELL DATA
Hole Diam. (in.) <u>10</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20-30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Spilt Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change & Gen. Desc. | Depth (ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|----------|----------------------------|------------|-------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 242 ppm | 1 | 1.1 | 0-2 | 5-7-10-7 | Fill Material | 0 | Asphalt. Brown sandy fill material.
1: Black oily, gravelly fill material. |
| 222 ppm | 2 | 0.6 | 2-4 | 2-2-2-2 | | 2 | Black oily fill material. |
| 56 ppm | 3 | 0.25 | 4-6 | 3-2-3-2 | | 4 | Black oily fill material. wet. Poor recovery |
| 147 ppm | 4 | 1.3 | 6-8 | 2-2-2-4 | Sand | 6 | 7: Red-brown medium sand, wet. |
| 42 ppm | 5 | 2.0 | 8-10 | 4-5-7-2 | | 8 | |
| 33 ppm | 6 | 0.9 | 10-12 | 3-2-2-3 | | 10 | |
| 13 ppm | 7 | 2.0 | 12-14 | 2-3-2-3 | Peat | 12 | Gray-brown medium sand, wet.
13: Peat. |
| | | | | | | 14 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130491

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 10D
Study No. _____ Date 5/5/90 & 5/7/90
Project 06606J
Client Monsanto
Page 1 of 2
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 5/5/90 Ended 5/7/90
Driller Epire Soils Investigations
Type of Rig Auger and Mud Rotary

WELL DATA
Hole Diam. (in.) 14
Final Depth (ft.) 29 BGS
Casing Diam. (in.) 8 and 4
Casing Interval (ft.) 0 - 19
Screen Interval (ft.) 19 - 29
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)
Date _____ DTW MP(2) _____ Elev.W.T. _____

SAMPLER
Type Split Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------|-------------------------------|---------------|-----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 1-1-1-1 | Fill Material | 0 | Black to brown fill with gravel. |
| 0.0 | 2 | 0. | 2-4 | 2-1-2-2 | | 2 | Black to brown fill with gravel, wet. |
| 0.0 | 3 | 0.9 | 4-6 | 2-3-4-4 | | 4 | |
| 0.0 | 4 | 1.8 | 6-8 | 2-3-4-4 | Sand | 6 | -6.5: Gray to red-brown medium to coarse sand, wet. |
| 0.0 | 5 | 2.0 | 8-10 | 4-4-5-8 | | 8 | |
| 0.0 | 6 | 2.0 | 12-12 | W/H-1-1-2 | Peat | 10 | -11.5: Peat |
| 1.8 | 7 | 1.3 | 12-14 | 1-2-1-4 | | 12 | |
| 1.8 | 8 | 1.3 | 14-16 | 6-9-10-15 | | 14 | |

REMARKS:

(1) in feet relative to a common datum

(2) from top of PVC casing

*NOTE: OVM background measurement on 5/7/90 was 1.8 ppm.

W/H - Weight of Hammer.

850130492

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>10D</u>
Study No. _____ Date <u>5/5/90 & 5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/5/90</u> Ended <u>5/7/90</u>
Driller <u>Epire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|-----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 1.8 | 9 | 1.5 | 16-18 | 6-9-10-15 | Peat | 16 | -17: brown silty medium sand with some gravel, wet. |
| 1.4 | 10 | 2.0 | 18-20 | 9-13-14-17 | | 18 | |
| 1.4 | 11 | 1.2 | 20-22 | 9-7-7-6 | Sand | 20 | Gray medium sand with some gravel, wet. |
| 1.4 | 12 | 1.5 | 22-24 | 7-10-8-8 | | 22 | |
| 1.4 | 13 | 2.0 | 24-26 | 10-11-9-9 | | 24 | |
| 1.4 | 14 | 2.0 | 26-28 | 7-7-5-6 | | 26 | |
| | | | | | | 28 | -27.5: Red-brown fine sand with silt, wet. |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130493

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>11D</u>
<div style="text-align: right; margin-right: 50px;">5/10/90 &</div> Study No. _____ Date <u>5/11/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | <b style="text-align: center;">WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <b style="text-align: center;">G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <b style="text-align: center;">SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <b style="text-align: center;">DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|---------|-------------------------------|---------------|--------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 44.0 | 1 | 0.75 | 0-2 | 4-3-2-2 | Fill Material | 0 | Gray to black oily fill material, strong organic odor. |
| 587.0 | 2 | 0.8 | 2-4 | 5-6-6-5 | | 2 | -3: Red-brown medium sand, wet. Strong organic odor. |
| NA | 3 | 0 | 4-6 | 2-6-7-9 | | 4 | No recovery. |
| 144.0 | 4 | 2.0 | 6-8 | 7-7-7-6 | | 6 | Red-brown medium sand with gravel, wet. Strong organic odor. |
| 170.0 | 5 | 2.0 | 8-10 | 5-4-2-2 | Sand | 8 | Red-brown gravel with sand, wet, strong organic odor. |
| 0.0 | 6 | 1.0 | 10-12 | 3-2-2-2 | | 10 | Gray medium sand, wet, no odor. |
| 0.0 | 7 | 2.0 | 12-14 | 1-1-2-5 | Peat | 12 | -13: Peat. |
| 0.5 | 8 | 2.0 | 15-17 | | | 14 | Note: Background OVM measurement on 5/11/90 was 0.5 ppm. |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130494

MO06606J.2.48 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>11D</u>
<div style="text-align: right; margin-right: 50px;">5/10/90 &</div> Study No. _____ Date <u>5/11/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|-------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| | | | | | Peat | 16 | |
| 0.5 | 9 | 1.5 | 17-19 | 6-6-10-11 | | 18 | -18.5: Gray-brown coarse sand, wet. |
| 0.7 | 10 | 2.0 | 19-21 | 6-10-13-13 | Sand | 19 | Gray medium to coarse sand, wet. |
| 0.7 | 11 | 2.0 | 21-23 | 9-11-11-10 | | 21 | Gray medium sand, wet. |
| | | | | | | 23 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130495

MO06606J.2.48 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>12D</u>
<div style="text-align: right; margin-right: 50px;">5/10/90 &</div> Study No. _____ Date <u>5/11/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------|-------------------------------|---------------|--------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 4-11-14-6 | | 0 | Black gravelly fill material. |
| 0.0 | 2 | 1.0 | 2-4 | 4-3-3-5 | Fill Material | 2 | |
| 0.0 | 3 | 0.5 | 4-6 | 2-3-4-5 | | 4 | -5: Gray medium sand, wet. |
| 0.0 | 4 | 1.7 | 6-8 | 4-4-8-7 | | 6 | -7: Red-brown medium and with some gravel. |
| 0.0 | 5 | 2.0 | 8-10 | 6-5-4-5 | Sand | 8 | Gray medium to coarse sand, wet. |
| 0.0 | 6 | 2.0 | 10-12 | 4-3-3-4 | | 10 | |
| 0.0 | 7 | 2.0 | 12-14 | 3-2-2-2 | | 12 | -13: Peat |
| 0.0 | 8 | 1.1 | 15-17 | 1-1-1-2 | Peat | 14 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130496

MO06606J.2.47 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>12D</u>
<div style="text-align: right; margin-right: 100px;">5/10/90 &</div> Study No. _____ Date <u>5-11-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | <p style="text-align: center;"><u>WELL DATA</u></p> Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <p style="text-align: center;"><u>G W READINGS(1)</u></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;"><u>SAMPLER</u></p> Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;"><u>DEVELOPMENT</u></p> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|---------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| | | | | | Peat | 16 | |
| 0.0 | 9 | 2.0 | 17-19 | 3-5-7-10 | | 18 | Brown silty medium sand, wet.
-18.5: Red silty medium sand, wet. |
| 0.0 | 10 | 1.3 | 19-21 | 4-10-11-11 | Sand | 20 | -19: Gray medium sand, wet. |
| 0.0 | 11 | 1.3 | 21-23 | 13-12-13-13 | | 21-23 | Gray medium sand, wet. |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130497

MO06606J.2.47 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>13D</u>

Study No. _____ Date <u>05/02/90 & 05/04/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/4/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 14</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|------------|------------|-------------------------------|---------------|-----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 13.5-15.5' | 1-1-1-1 | Peat | 13 | Peat. |
| 0.0 ppm | 2 | 2.0 | 15.5-17.5' | 5-4-4-4 | | 15 | |
| | | | | | | 17 | Gray brown fine to medium sand with some silt, wet. |
| 0.0 ppm | 3 | 2.0' | 17.5-19.5' | 10-19-9-14 | | 19 | |
| 0.0 ppm | 4 | 1.0' | 19.5-21.5' | 2-7-7-8 | | 21 | |
| 0.0 ppm | 5 | 1.8' | 21.5-23.5' | 5-7-7-13 | | 23 | 22': Red brown medium sand, wet. |
| 0.0 ppm | 7 | 1.3' | 25.5-27.5' | 4-7-5-6 | Silt and Clay | 25 | Gray silt and varved clay, wet. |
| 0.0 ppm | 8 | 1.3' | 27.5-29.5' | 6-10-10-11 | | 27 | Gray silt and varved clay, wet. |
| | | | | | | 29 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130498

MO06606J.2.19 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>135</u>

Study No. _____ Date <u>04/30/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>16:07</u> Ended <u>16:55</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>10 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0 - 3</u>
Screen Interval (ft.) <u>3 - 10</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | | | 0-1' | | | | Black fill material |
| 0.0 ppm | 1 | 1.1' | 1-3' | 79-43-34-25 | Fill Material | 1 | |
| | | | | | | | 1.5': Brown to dark gray silty fine to medium sand with some gravel. |
| NA | 2 | 0 | 3-5' | 12-13-11-7 | Silty Sand | 3 | No recovery, spoon was wet. |
| 0.0 ppm | 3 | 1.3' | 5-7' | 4-6-6-5 | | 5 | Black silty medium to coarse sand with gravel, wet. |
| 0.0 ppm | 4 | 1.0' | 7-9' | 2-1-1-2 | Peat and Clay | 7 | 6': Peat with clay, wet. |
| | | | | | | 9 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130499

MO06606J.2.14 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>14D</u>

Study No. _____ Date <u>05/02/90 & 05/03/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/3/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17</u>
Screen Interval (ft.) <u>17 - 27</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|--------|------------|-----------|-------------------------------|---------------|----------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 7-9' | 4-6-5-6 | Medium Sand | 7 | Gray to reddish-brown medium sand with some gravel, wet. |
| 0.0 ppm | 2 | 2.0' | 9-11' | 2-1-1-1 | Peat | 9 | 10': Peat. |
| 0.0 ppm | 3 | 1.6' | 11-13' | 2-1-2-3 | | 11 | |
| 0.0 ppm | 4 | 1.7' | 13-15' | 1-2-2-4 | | 13 | |
| 0.0 ppm | 5 | 1.8' | 15-17' | 5-8-10-14 | Sand | 15 | 15.6': Grayish-brown silty medium sand, wet. |
| 0.0 ppm | 6 | 2.0' | 17-19' | 5-6-8-9 | | 17 | Gray gravelly coarse sand, wet. |
| 0.0 ppm | 7 | 19-21' | 9-10-10-10 | | | 19 | |
| | | | | | | 21 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130500

MO06606J.2.17 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>14S</u>

Study No. _____ Date <u>04/30/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>12:05</u> Ended <u>14:45</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>10 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0-3</u>
Screen Interval (ft.) <u>3-10</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------------|-------------------------------|---------------|-------------------------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | | | 0-1 | | Fill Material | 1 | Black Fill Material |
| 0.0 ppm | 1 | 1.5 | 1-3 | 7-8-8-12 | | 3 | 2.5: Reddish brown silty medium to coarse sand.
4: Grayish brown silty medium to coarse sand, wet. |
| 0.0 ppm | 2 | 1.8 | 3-5 | 8-9-12-11 | Silty Sand | 5 | Grayish brown silty medium to coarse sand with some gravel, wet. |
| 0.0 ppm | 3 | 1.3 | 5-7 | 2-2-3-5 | | 7 | |
| 0.0 ppm | 4 | 0.8 | 7-9 | 7-7-9-12 | Peat and Clay | 9 | Grayish brown clay with peat and black organic material, wet. |
| 0.0 ppm | 5 | 2.0 | 9-11 | Weight of hammer | | 11 | |
| 0.0 ppm | 6 | 2.0 | 11-13 | 11-4-4-3 | | 13 | |
| 0.0 ppm | 7 | 2.0 | 13-15 | 4-3-3-2 | | 15 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130501

MO06606J.2.13 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>15D</u>

Study No. _____ Date <u>05/02/90</u>
Project <u>06606J</u> <u>05/03/90</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/3/90</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|-------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.9' | 17-19' | 29-24-24-26 | Peat | 17 | Peat.
18': Gray brown silty medium sand, wet. |
| 0.0 ppm | 2 | 2.0' | 19-21' | 23-33-39-41 | Silty Sand | 19 | Gray gravelly coarse sand, wet.
20': Gray brown silty medium sand, wet. |
| 0.0 ppm | 3 | 1.1' | 21-23' | 17-19-15-10 | | 21 | |
| 0.0 ppm | 4 | 1.8' | 23-25' | 10-11-12-12 | | 23 | 24.5': Gray brown silty fine sand, wet. |
| 0.0 ppm | 5 | ? | 25-27' | 2-1-1-2 | | 25 | Note: Sample slipped out of split spoon
after being removed from borehole. |
| 0.0 ppm | 6 | 1.7' | 27-29' | 5-8-8-4 | | 27 | Gray brown silty fine sand, wet. |
| | | | | | | 29 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130502

MO06606J.2.18 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>15S</u>

Study No. _____ Date <u>05/01/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powlev</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>13:00</u> Ended <u>14:55</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>15 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0 - 5</u>
Screen Interval (ft.) <u>5 - 15</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|--------------|-------------|-------------------------------|---------------|----------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.3' | 0-1'
1-3' | 15-23-42-40 | Fill Material | 1 | Black fill material.
Dark gray to black silty sandy fill material with gravel, wet. |
| 1.4 ppm | 2 | 1.3' | 3-5' | 15-16-42-40 | | 3 | 3.5': Light gray medium to coarse sand with gravel, wet. No odors. |
| 0.2 ppm | 3 | 1.6' | 5-7' | 8-9-10-14 | | 5 | |
| 0.2 ppm | 4 | 2.0' | 7-9' | 9-15-15-18 | Medium Sand | 7 | Light gray to brown medium sand with silt, wet. |
| 0.2 ppm | 5 | 1.1' | 9-11' | 32-30-27-30 | | 9 | |
| 0.0 ppm | 6 | 2.0' | 11-13' | 6-11-7-9 | | 11 | |
| 0.0 ppm | 7 | 2.0' | 13-15' | 2-2-2-4 | Peat | 13 | Peat. |
| 0.0 ppm | 8 | 2.0' | 15-17' | 2-3-2-3 | | 15 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130503

MO06606J.2.16 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>16S</u>

Study No. _____ Date <u>5/1/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>09:00</u> Ended <u>11:02</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>13 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0 - 3</u>
Screen Interval (ft.) <u>3 - 13</u>
Screen Slot & Type <u>0.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|--------------|-------------|-------------------------------|---------------|---------------------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 0-1'
1-3' | 24-33-30-43 | | 1 | Brown to black fill material with sand, silt and gravel. |
| 0.0 ppm | 2 | 1.2' | 3-5' | 13-6-7-9 | Fill Material | 3 | Brown to black fill material with sand, silt and gravel. Organic odor present, wet. |
| 9.0 ppm | 3 | 1.0' | 5-7' | 10-4-7-6 | | 5 | Brown to black fill material with sand, silt and gravel. Organic odor present, wet. |
| 0.0 ppm | 4 | 1.8' | 7-9' | 6-6-4-5 | | 7 | 7.7: Reddish brown silty medium sand with gravel, wet, no odor. |
| 1.0 ppm | 5 | 0.8' | 9-11' | 2-1-2-4 | Silty Sand | 9 | Black to brown silty medium to coarse silty sand with some gravel, hydrocarbon odor present, wet. |
| 0.0 ppm | 6 | 2' | 11-13' | 2-2-2-2 | | 11 | |
| | | | | | Peat | | 12.5': Peat, no odor, wet. |
| | | | | | | 13 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130504

MO06606J.2.15 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>6D</u>
Study No. _____ Date <u>5/4/90 & 5/5/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/4/90</u> Ended <u>5/5/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and mud rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27.5 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17.5</u>
Screen Interval (ft.) <u>17.5 - 27.5</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|--------------------------|-------------------------------|---------------|----------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 4-4-4-9 | Fill Material | 0 | Black gravelly fill material. |
| NA | 2 | 0 | 2-4 | 9-4-3-3 | | 2 | No recovery. |
| 5.0 | 3 | 1.7 | 4-6 | 6-7-5-7 | | 4 | Gray to red-brown medium sand with silt, slight organic odor present, wet. |
| 16.0 | 4 | 1.7 | 6-8 | 1-1-2-2 | Sand | 6 | Red-brown medium sand with silt, slight organic odor present, wet. |
| 3.0 | 5 | 1.7 | 8-10 | 4-3-4-4 | | 8 | |
| 0.0 | 6 | 2.0 | 10-12 | 2-1-1-1 | | 10 | Dark gray medium to coarse sand with silt, wet. |
| | | | | | | 11.8 | Peat |
| 0.0 | 7 | 2.0 | 12-14 | Weight of hammer
-1-1 | Peat | 12 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130505

MO06606J.1.43 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>6D</u>
<div style="text-align: right; margin-right: 100px;">5/4/90 &</div> Study No. _____ Date <u>5/5/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/4/90</u> Ended <u>5/5/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and mud rotary</u> | <b style="text-align: center;">WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27.5 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17.5</u>
Screen Interval (ft.) <u>17.5 - 27.5</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <b style="text-align: center;">G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <b style="text-align: center;">SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <b style="text-align: center;">DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|-------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 8 | 0.5 | 14-16 | 1-1-3-4 | Peat | 14 | |
| 0.0 | 9 | 2.0 | 16-18 | 9-15-18-14 | | 16 | Red-brown medium sand with silt and some gravel, wet. |
| 0.0 | 10 | 1.3 | 18-20 | 10-10-9-8 | | 18 | |
| 0.0 | 11 | 1.2 | 20-22 | 7-9-9-11 | Sand | 20 | Red-brown medium sand with silt and some gravel, wet. |
| 0.0 | 12 | 1.7 | 22-24 | 6-5-9-8 | | 22 | |
| 0.0 | 13 | 2.0 | 24-26 | 14-19-19-22 | | 24 | -25: Fine gray sand with silt, wet. |
| 0.0 | 14 | 2.0 | 26-28 | 17-12-12-13 | Silt | 26 | Gray silt, wet. |
| | | | | | | 28 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130506

MO06606J.1.43 7.90

APPENDIX A-2

Geologic Logs - Phase I Soil Borings.

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>TSP-146</u>

Study No. _____ Date <u>5/9/90</u>
Project <u>00606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Tertiary Settling Pond</u>
M.P. Elevation _____
Drilling Started <u>5/9/90</u> Ended <u>5/9/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Tripod-Hammer Driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------------|-------------------------------|---------------|---------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5 | 0-2 | * See note below | Silt and Clay | 0 | Light brown fine sand.
-.05: Black silt and clay. |
| 0.0 ppm | 2 | 1.2 | 2-4 | | | 2 | Black silt and clay. |
| 2.0 ppm | 3 | 2.0 | 4-6 | | Sand | 4 | |
| | | | | | | 6 | -.5: Black medium sand with silt, wet, hydrogen sulfide odor. |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing
 *NOTE: Blow counts could not be obtained using tripod. Not enough space to pull the hammer high enough.

850130508

MO06606J.2.32 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>TSP-246</u>

Study No. _____ Date <u>5-9-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Tertiary Settling Pond</u>
M.P. Elevation _____
Drilling Started _____ Ended _____
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Tripod-Hammer Driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------------|-------------------------------|---------------|-------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.6 | 0-2 | * See note below. | Fill Material | 0 | Black fill material with gravel, silt and clay. |
| 0.0 ppm | 2 | 0.9 | 2-4 | | | 2 | Black silty fill. |
| 0.0 ppm | 3 | 1.4 | 4-6 | | | 4 | Black clay and silt, wet. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing
 *NOTE: Blow counts could not be obtained using tripod. Not enough space to pull the hammer high enough.

850130509

MO06606J.1.33 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>TSP-446</u>

Study No. _____ Date <u>5-9-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Teritary Settling Pond</u>
M.P. Elevation _____
Drilling Started <u>5/9/90</u> Ended <u>5/9/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Tripod-hammer driven</u> | <p style="text-align: center;"><u>WELL DATA</u></p> Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | <p style="text-align: center;"><u>G W READINGS(1)</u></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;"><u>SAMPLER</u></p> Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;"><u>DEVELOPMENT</u></p> | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------------|-------------------------------|---------------|------------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.6 | 0-2 | * See note below | Fill Material | 0 | Black to brown fill material with gravel. |
| 402 ppm | 2 | 1.0 | 2-4 | | | 2 | Gray to black fill material.
3.8: Black oily fill material, very strong organic odor. |
| 58 ppm | 3 | 1.8 | 4-6 | | | 4 | Gray medium sand, wet, strong organic odor. |
| | | | | | Sand | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing
 *NOTE: Blow counts could not be obtained using tripod. Not enough space to pull the hammer high enough.

850130510

MO06606J.2.35 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-146</u>

Study No. _____ Date <u>5-7-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powlev</u>
Loc. <u>Secondary Settling Pond</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Auger-Hammer Driven</u> | <u>WELL DATA</u>
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | <u>G W READINGS(1)</u>
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <u>SAMPLER</u>
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <u>DEVELOPMENT</u> | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------|-------------------------------|---------------|----------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 0.8 | 0-2 | 12-10-9-7 | Gravel and Fill
Material | 0 | Gravel, wet. |
| 5.0 ppm | 2 | 0.6 | 2-4 | 6-3-4-3 | | 2 | Gravel, oily, wet. |
| 2.6 ppm | 3 | 0.8 | 4-6 | 4-3-5-3 | | 4 | -5: Gray medium sand, wet. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130511

MO6606J.2.31 7.90

GEOLOGIC LOG

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|--------------------|-------------------------------|---------------|--------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5 | 0-2 | *See note
below | Fill Material | 0 | Brown fill material with silt, sand, brick
chunks. |
| 0.0 ppm | 2 | 1.8 | 2-4 | | | 2 | Red-brown silty clay. |
| 13 ppm | 3 | 1.8 | 4-6 | | | 4 | Black to gray silty medium sand, wet,
organic odor. |
| | | | | | Sand | 6 | |

850130512

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-246</u>

Study No. _____ Date <u>5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Secondary Settling Pond</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-Hammer Driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGs</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|-----------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 11 ppm | 1 | 1.1 | 0-2 | 12-17-23-20 | Fill
Material | 0 | Black fill material with silt and gravel, organic odor. |
| 824 ppm | 2 | 1.0 | 2-4 | 37-43-43-59 | | 2 | Black fill material, oily, very strong organic odor. |
| 801 ppm | 3 | 1.0 | 4-6 | 22-8-4-4 | | 4 | Black fill material, oily, wet, very strong organic odor. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130513

MO06606J.2.30 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-346</u>

Study No. _____ Date <u>5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Secondary Settling Pond</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-Hammer Driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 128 ppm | 1 | 1.7 | 0-2 | 17-20-25-16 | Fill Material | 0 | Black fill material with silt and gravel, strong organic odor. |
| 654 ppm | 2 | 1.0 | 2-4 | 15-18-28-17 | Sand | 2 | Gray medium sand, strong organic odor. |
| 669 ppm | 3 | 1.0 | 4-6 | 6-11-12-13 | | -3 | Black oily sand, very strong organic odor. |
| | | | | | | 4 | Black oily sand, very strong organic odor. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130514

MO06606J.2.29 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APS-146</u>

Study No. _____ Date <u>5/14/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>AP/Sterox Area</u>
M.P. Elevation _____
Drilling Started <u>5/14/90</u> Ended <u>5/14/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-hammer driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|---------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 258 ppm | 1 | 1.4 | 0-2 | 14-12-13-12 | Fill Material | 0 | Black fill material with gravel, sweet hydrocarbon odor. |
| 36 ppm | 2 | 1.0 | 2-4 | 7-5-4-6 | | 2 | Black fill material with gravel, wet, oily, sweet hydrocarbon odor. |
| 37 ppm | 3 | 1.2 | 4-6 | 110-72-21-7 | | 4 | Black fill material, wet, oily, sweet hydrocarbon odor. |
| | | | | | | 5.5 | Concrete and yellow sand, wet. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130515

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APS-246</u>

Study No. _____ Date <u>5-14-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>AP/Sterox Area</u>
M.P. Elevation _____
Drilling Started <u>5/14/90</u> Ended <u>5/14/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-hammer driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|---------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 97 ppm | 1 | 0.7 | 0-2 | 25-13-13-7 | Fill Material | 0 | Black fill material with gravel, concrete, wet, organic odor. |
| 7 ppm | 2 | 0.6 | 2-4 | 8-5-4-4 | | 2 | Black fill material with gravel, wet, organic odor. |
| 19 ppm | 3 | 0.5 | 4-7 | 4-2-3-3 | | 4 | Black fill material with gravel, wet. Organic odor. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130516

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APS-346</u>

Study No. _____ Date <u>5-14-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>AP/Sterox Area</u>
M.P. Elevation _____
Drilling Started _____ Ended _____
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-hammer driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 398 ppm | 1 | 1.5 | 0-2 | 21-11-14-7 | | 0 | Red silty clay |
| | | | | | | | 0.5: Black oily fill material strong organic odor. |
| 304 ppm | 2 | 1.5 | 2-4 | 4-6-6-5 | Fill Material | 2 | Black oily fill material, wet. |
| | | | | | | | |
| 70 ppm | 3 | 2.0 | 4-6 | 4-3-2-2 | Sand | 4 | 4.5: Gray medium sand, wet, organic odor. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130517

MO06606J.2.37 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>PDA-1</u>

Study No. _____ Date <u>5/15/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>PCB Disposal Area</u>
M.P. Elevation _____
Drilling Started <u>5/15/90</u> Ended <u>5/15/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Hollow stem auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>29</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|----------|-------------------------------|---------------|----------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 5.0 ppm | 1 | 0.5 | 15-17 | 4-2-2-3 | | 15 | Peat. |
| 0.0 ppm | 2 | 2.0 | 17-19 | 2-2-1-2 | Peat | 17 | |
| 2.0 ppm | 3 | 1.8 | 19-21 | 3-5-7-8 | | 19 | 18: Gray silty fine to medium sand, wet. |
| 1.6 ppm | 4 | 2.0 | 21-23 | 8-10-8-8 | | 21 | Gray-brown silty medium sand, wet. |
| 4.0 ppm | 5 | 2.0 | 23-25 | 7-6-5-4 | Sand | 23 | |
| 2.0 ppm | 6 | 2.0 | 25-27 | 3-4-4-4 | | 25 | Gray-brown silty medium to coarse sand, wet. |
| | | | | | | 27 | |
| | | | | | Clay and Silt | 28 | 28: Gray varved clay and brown silt. |
| | | | | | | 29 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130518

MO06606J.2.42 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>PDA-2</u>

Study No. _____ Date <u>05/16/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>PCB Disposal Area</u>
M.P. Elevation _____
Drilling Started <u>5/16/90</u> Ended <u>5/16/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|----------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.8' | 15-17' | 2-1-3-2 | Peat | 15' | Peat. |
| 0.0 ppm | 2 | 2.0' | 17-19' | 3-5-2-3 | | 17' | 18': Gray-brown silty medium sand, wet. |
| 0.0 ppm | 3 | 2.0' | 19-21' | 7-14-14-12 | | 19' | Gray medium to coarse sand, wet.
20': Red-brown medium sand, wet. |
| 0.0 ppm | 4 | 2.0' | 21-23' | 8-13-12-14 | Sand | 21' | 22': Light gray medium sand, wet. |
| 0.0 ppm | 5 | 2.0' | 23-25' | 12-8-10-11 | | 23' | Gray-brown silty medium sand, wet. |
| 0.0 ppm | 6 | 1.2' | 25-27' | 9-7-7-5 | | 25' | Red-brown silty medium sand, wet. |
| | | | | | | 26' | Red-brown silt with clay, wet. |
| | | | | | | 27' | Red-brown silty coarse sand, wet. |
| 0.0 ppm | 7 | 2.0' | 27-29' | 5-12-14-13 | Clay and Silt | 28' | Gray varved clay and red-brown silt, wet. |
| | | | | | | 29' | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130519

MO06606J.2.20 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>AS-146</u>

Study No. _____ Date <u>5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Acid Sump Area</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-Hammer Driven</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|--------------|-------------------------------|---------------|---------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.8' | 0-2' | 41-100-61-16 | Fill Material | 0 | Brown, gray, black fill with gravel. |
| 0.0 ppm | 2 | 1.3' | 2-4' | 26-33-33-47 | Sand | 2 | Black fill, wet. |
| 0.0 ppm | 3 | 2.0' | 4-6' | 36-82-100-74 | | 3' | Gray medium sand with gravel and silt, wet. |
| | | | | | | 4 | Gray medium sand with gravel and silt, wet. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130520

MO06606J.2.21 6.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>AS-346</u>

Study No. _____ Date <u>5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Acid Sump Area</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-hammer driven</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.6 | 0-2 | 17-20-25-16 | | 0 | Black fill material with gravel |
| 0.0 ppm | 2 | 1.0 | 2-4 | 15-18-28-17 | Fill Material | 2 | Black fill material with gravel. |
| 0.0 ppm | 3 | 1.7 | 4-6 | 6-11-12-13 | Sand | 4 | Gray medium sand, wet. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130521

MO06606J.2.41 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>AS-246</u>

Study No. _____ Date <u>5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. <u>Acid Sump Area</u>
M.P. Elevation _____
Drilling Started <u>5/7/90</u> Ended <u>5/7/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger-hammer drive</u> | WELL DATA
Hole Diam. (in.) <u>NA</u>
Final Depth (ft.) <u>6 BGS</u>
Casing Diam. (in.) <u>NA</u>
Casing Interval (ft.) <u>NA</u>
Screen Interval (ft.) <u>NA</u>
Screen Slot & Type <u>NA</u>
Well Status <u>NA</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.1 | 0-2 | 12-17-23-20 | Fill Material | 0 | Black fill material with gravel, wet. |
| 0.0 ppm | 2 | 0.3 | 2-4 | 37-43-43-59 | | 2 | Black fill material with gravel, wet. |
| 15.0 ppm | 3 | 1.1 | 4-6 | 22-8-4-4 | Sand | 4 | Gray medium sand, wet, organic odor present. |
| | | | | | | 6 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130522

MO06606J.2.40 7.90

APPENDIX A-3

Geologic Logs - Phase II Soil Boring.

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APSS-4</u>

Study No. <u>066061</u> Date <u>4/4/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>1415</u> Ended <u>1454</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT
<u>N/A</u> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|---------|-------------------------------|----------------|--------------------------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 394.0 | #1 | 12 | 0-2 | 5-5-3-3 | | 0- | Black, oily, coarse, medium dense fill material with trace of silt and sand. Strong organic odor, wet. |
| 272.0 | #2 | 8 | 2-4 | 4-6-7-2 | FILL | 2- | |
| 21.0 | #3 | 10 | 4-6 | 6-6-4-7 | SILTY SAND | 4- | Dark gray-brown, medium dense, silty sand. Strong organic odor, wet. |
| 12.0 | #4 | 22 | 6-8 | 8-8-6-7 | SILTY SAND WITH GRAVEL | 6- | Dark gray-brown, medium dense, silty sand with trace of gravel. Weak organic odor, wet. |
| 54.0 | #5 | 18 | 8-10 | 8-7-6-7 | | 8- | |
| 13.0 | #6 | 15 | 10-12 | 2-1-1-4 | | 10- | |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130524

MO066061.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APSS-5</u>

Study No. <u>06606J</u> Date <u>4/4/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>

M.P. Elevation <u>N/A</u>
Drilling Started <u>1243</u> Ended <u>1410</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>2" Split-Spoon</u> <u>N/A</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|---------|-------------------------------|----------------|----------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 3.0 | #1 | 15 | 0-2 | 9-7-3-4 | | 0- | Black, oily, medium dense fill material with trace of silt and sand. |
| 39.0 | #2 | 16 | 2-4 | 7-9-8-7 | FILL | 2- | |
| 29.0 | #3 | 15 | 4-6 | 6-3-3-3 | SILTY SAND | 4- | Gray-brown, medium dense, silty sand, wet. |
| 34.0 | #4 | 24 | 6-8 | 4-3-4-7 | SILTY SAND AND GRAVEL | 6- | Gray-brown, medium dense, silty sand with trace of gravel, wet. |
| 3.0 | #5 | 18 | 8-10 | 2-2-3-2 | | 8- | |
| 3.0 | #6 | 13 | 10-12 | 2-2-2-2 | | 10- | |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130525

MO06606J.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>APSS-6</u>

Study No. <u>066061</u> Date <u>4/4/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>1500</u> Ended <u>1554</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> <u>N/A</u> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|----------|-------------------------------|----------------|-----------------------------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 77.0 | #1 | 6 | 0-2 | 4-2-4-7 | FILL | 0- | Black, oily, coarse, medium dense fill material with trace of silt and sand. Organic odor. Poor recovery. |
| 67.0 | #2 | 6 | 2-4 | 4-1-1-4 | | 2- | |
| — | #3 | — | 4-6 | 18-3-2-2 | | 4- | Wood present at end of split-spoon. No recovery. |
| 15.0 | #4 | 15 | 6-8 | 4-3-3-3 | SILTY SAND | 6- | Dark gray-brown, medium dense, silty sand, wet. Slight organic odor. |
| — | #5 | — | 8-10 | 5-6-5-4 | | 8- | No recovery, white suds in cuttings. |
| 30.0 | #6 | 8 | 10-12 | 4-2-4-3 | | 10- | Dark gray-brown, coarse, loose sand with trace of silt and gravel, wet. Slight organic odor. |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130526

MO06606J.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-4</u>

Study No. <u>06606J</u> Date <u>4/5/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>1050</u> Ended <u>1125</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT
<u>N/A</u> | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|-------------|-------------------------------|----------------|------------------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 34.0 | #1 | 15 | 0-2 | 11-10-13-10 | FILL | 0- | Black, medium dense, coarse fill material. Slight organic odor. |
| 224.0 | #2 | 13 | 2-4 | 9-4-5-4 | SILTY SAND | 2- | Gray-brown, medium dense, silty sand with trace of gravel, wet. Strong organic odor. |
| 142.0 | #3 | 12 | 4-6 | 3-4-3-4 | COARSE SAND | 4- | Black, oily, medium dense, coarse, silty sand with trace of gravel, wet. |
| 132.0 | #4 | 18 | 6-8 | 3-3-3-4 | | 6- | |
| 106.0 | #5 | 24 | 8-10 | 3-3-3-6 | | 8- | Gray-brown, medium dense, coarse sand with trace of silt and gravel, wet. Strong organic odor. |
| 110.0 | #6 | 24 | 10-12 | 3-3-3-3 | | 10- | |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130527

MO06606J.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-5</u>

Study No. <u>06606J</u> Date <u>4/5/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>0955</u> Ended <u>1050</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> N/A | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|------------|-------------------------------|----------------|-----------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.0 | #1 | 4 | 0-2 | 21-16-10-8 | FILL | 0- | Gravel, wet. Poor recovery, no odor. |
| - | #2 | - | 2-4 | 9-6-4-4 | | 2- | No recovery. |
| 15.0 | #3 | 18 | 4-6 | 10-7-7-9 | COARSE SAND | 4- | Gray-brown, medium dense, coarse sand with trace of silt and gravel, wet. Organic odor. |
| 44.0 | #4 | 14 | 6-8 | 3-4-4-4 | | 6- | |
| 17.0 | #5 | 10 | 8-10 | 5-3-4-6 | SILTY SAND | 8- | Gray-brown, medium dense, fine silty sand, wet. Slight organic odor. |
| 12.0 | #6 | 16 | 10-12 | 3-3-4-6 | | 10- | |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130528

MO06606J.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-6</u>

Study No. <u>06606I</u> Date <u>4/5/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>1142</u> Ended <u>1245</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> N/A | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|-------------|-------------------------------|----------------|------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 110.0 | #1 | 6 | 0-2 | 9-7-6-4 | FILL | 0 | Black, oily, medium dense, coarse fill material. Strong organic odor. |
| 290.0 | #2 | 15 | 2-4 | 6-6-5-4 | | 2 | |
| 158.0 | #3 | 14 | 4-6 | 5-3-3-5 | SILTY SAND | 4 | Dark gray, oily, loose, silty sand with trace of gravel, wet. Strong organic odor. |
| 12.0 | #4 | 24 | 6-8 | 12-10-12-10 | | 6 | Dark gray, medium dense, silty sand with trace of gravel, wet. Less organic odor. |
| 34.0 | #5 | 24 | 8-10 | 4-7-8-16 | | 8 | |
| 80.0 | #6 | 24 | 10-12 | 3-4-6-8 | | 10 | |
| | | | | | | 12 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130529

MO06606J.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>SSP-7</u>

Study No. <u>066061</u> Date <u>4/5/91</u>
Project <u>Monsanto Kearny Plant</u>
Client <u>Monsanto Company</u>
Page <u>1</u> of <u>1</u>
Logged By <u>Jeff Powley</u>
Loc. <u>N/A</u>
M.P. Elevation <u>N/A</u>
Drilling Started <u>0900</u> Ended <u>0950</u>
Driller <u>M&R Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>4.0</u>
Final Depth (ft.) <u>12.0</u>
Casing Diam. (in.) <u>N/A</u>
Casing Interval (ft.) <u>N/A</u>
Screen Interval (ft.) <u>N/A</u>
Screen Slot & Type <u>N/A</u>
Well Status <u>Boring Sealed</u> | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>2" Split-Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT
N/A | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|----------|-------------------------------|----------------|-----------------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 7.0 | #1 | 10 | 0-2 | 7-8-7-11 | FILL | 0- | Gray-brown fill material with little coarse sand and silt. Organic odor. |
| 163.0 | #2 | 8 | 2-4 | 7-6-15-4 | SILTY SAND | 2- | Gray-brown, medium dense, silty sand, wet. Strong organic odor. |
| 93.0 | #3 | 10 | 4-6 | 3-2-1-3 | COARSE SAND | 4- | Black, oily, very loose, coarse sand with trace of silt and gravel, wet. Strong organic odor. |
| 52.0 | #4 | 14 | 6-8 | 5-3-3-3 | | 6- | Gray brown, loose, coarse sand with trace of silt and gravel, wet. Strong organic odor. |
| 6.0 | #5 | 6 | 8-10 | 3-2-4-3 | | 8- | Same as above, poor recovery, less odor. |
| 7.0 | #6 | 24 | 10-12 | 12-8-7-5 | | 10- | |
| | | | | | | 12- | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130530

MO066061.6.22 4.91

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. TSP-5
Study No. 06606I Date 4/4/91
Project Monsanto Kearny Plant
Client Monsanto Company
Page 1 of 1
Logged By Jeff Powley
Loc. N/A
M.P. Elevation N/A
Drilling Started 1715 Ended 1810
Driller M&R Soils Investigation
Type of Rig Hollow Stem Auger

WELL DATA
Hole Diam. (in.) 4.0
Final Depth (ft.) 12.0
Casing Diam. (in.) N/A
Casing Interval (ft.) N/A
Screen Interval (ft.) N/A
Screen Slot & Type N/A
Well Status Boring Sealed

G W READINGS(1)
Date DTW MP(2) Elev.W.T.

SAMPLER
Type 2" Split-Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT
N/A

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|----------|-------------------------------|----------------|-------------------------------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.0 | #1 | 6 | 0-2 | 3-3-6-7 | CLAY | 0 | Gray-brown, very stiff clay with trace of sand. Slight plasticity, wet. No odor. |
| 124.0 | #2 | 10 | 2-4 | 6-5-3-4 | | 2 | Black, oily, medium dense, coarse sand with trace of silt and gravel, wet. Strong organic odor. |
| 10.0 | #3 | 6 | 4-6 | 7-7-10-6 | COARSE SAND | 4 | |
| 121.0 | #4 | 14 | 6-8 | 6-5-6-8 | | 6 | Gray-brown, medium dense, coarse sand, wet. Strong organic odor. |
| 51.0 | #5 | 24 | 8-10 | 5-7-8-9 | | 8 | |
| 30.0 | #6 | 24 | 10-12 | 6-8-8-5 | | 10 | |
| | | | | | | 12 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130531

MO06606I.6.22 4.91

APPENDIX B

Well Construction Specifications.

APPENDIX B-1

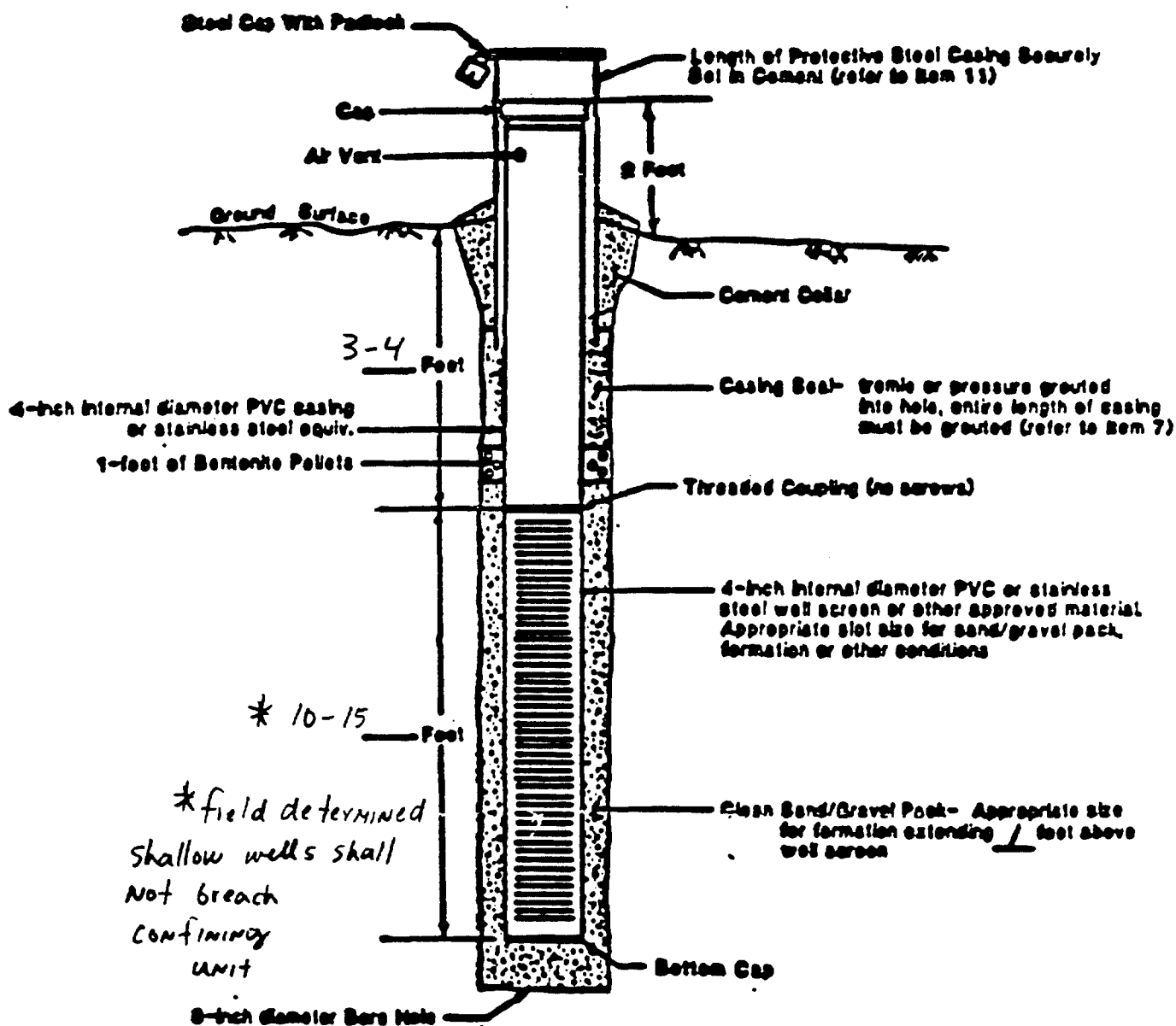
Unconsolidated Well Specifications.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION MONITOR WELL SPECIFICATIONS FOR UNCONSOLIDATED FORMATIONS

SITE NAME: _____

LOCATION: _____

DATE: _____



NOT TO SCALE

1. Notification to the NJDEP is required two weeks prior to drilling.
2. State well permits are required for each monitoring well constructed by the driller. The well permit tag must be permanently affixed to each monitoring well.
3. Copies of the site specific well specifications must be maintained at the drilling site by the driller.
4. The monitoring well must be installed by a New Jersey licensed well driller.
5. Monitoring well design must conform with NJAC 7:9-7, 8, and 9.
6. The borehole diameter must be a minimum of .4 inches greater than the casing diameter.
7. Acceptable grouting materials are:
 - Neat Cement - 6 gallons of water per 94 pound bag of cement.
 - Granular Bentonite - 1 gallon of water per 1.5 pounds of bentonite.
 - Cement-Bentonite - 8 gallons of water to 5 pounds of bentonite dry mixed per 94 pound bag of cement.
 - Cement-Bentonite - 10 gallons of water per 8 pounds of bentonite water-mixed with a 94 pound bag of cement.
 - Non-expandable cement - 7.5 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 4 pounds of bentonite and 94 pounds of cement.
 - Non-expandable cement - 7 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 94 pounds of cement (Type I or Type II).
8. Potable water must be used for mixing grouting materials and drilling fluids.
9. Only threaded joints are acceptable as couplings.
10. The driller must maintain an accurate written log of all materials encountered, record construction details for each well, and record the depths water bearing zones. This information must be submitted to the Bureau of Water Allocation as required by N.J.S.A. 58:4A.
11. A length of protective steel casing with a locking cap must be securely set in cement around the well casing. Flush mount monitoring wells are acceptable provided they have manholes, locking caps, and seals to prevent leakage of surface water into the well.

12. Top of each well casing (excluding cap) must be surveyed to the nearest 0.01 foot by a New Jersey licensed surveyor. The survey point must be marked on each well.
13. Wells must be developed to a turbidity-free discharge.
14. Modifications to designs are allowed only with NJDEP approval.

Additional Requirements (if checked):

Split Spoon Samples (X) Must be obtained at one well (deeper) of cluster

Borehole Geophysical Logs () _____

Top of Screen set 1-2 feet above below water table

Dedicated Bailer (Sampler) in Well () _____

Other (X) All borings shall be field screened with OUA or HNU
screen and gravel pack size
appropriate for the formation

Notice is Hereby Given of the Following:

Review by the Department of well locations and depths is limited solely to review for compliance with the law and Department rules.

The Department does not review well locations or depths to ascertain the presence of, nor the potential for, damage to any pipeline, cable, or other structures.

The permittee (applicant) is solely responsible for the safety and adequacy of the design and construction of monitoring well(s) required by the Department.

The permittee (applicant) is solely responsible for any harm or damage to person or property which results from the construction or maintenance of any well; this provision is not intended to relieve third parties of any liabilities or responsibilities which are legally theirs.

APPENDIX B-2

Confined, Unconsolidated Well Specifications.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONITOR WELL SPECIFICATIONS FOR
CONFINED UNCONSOLIDATED AQUIFERS

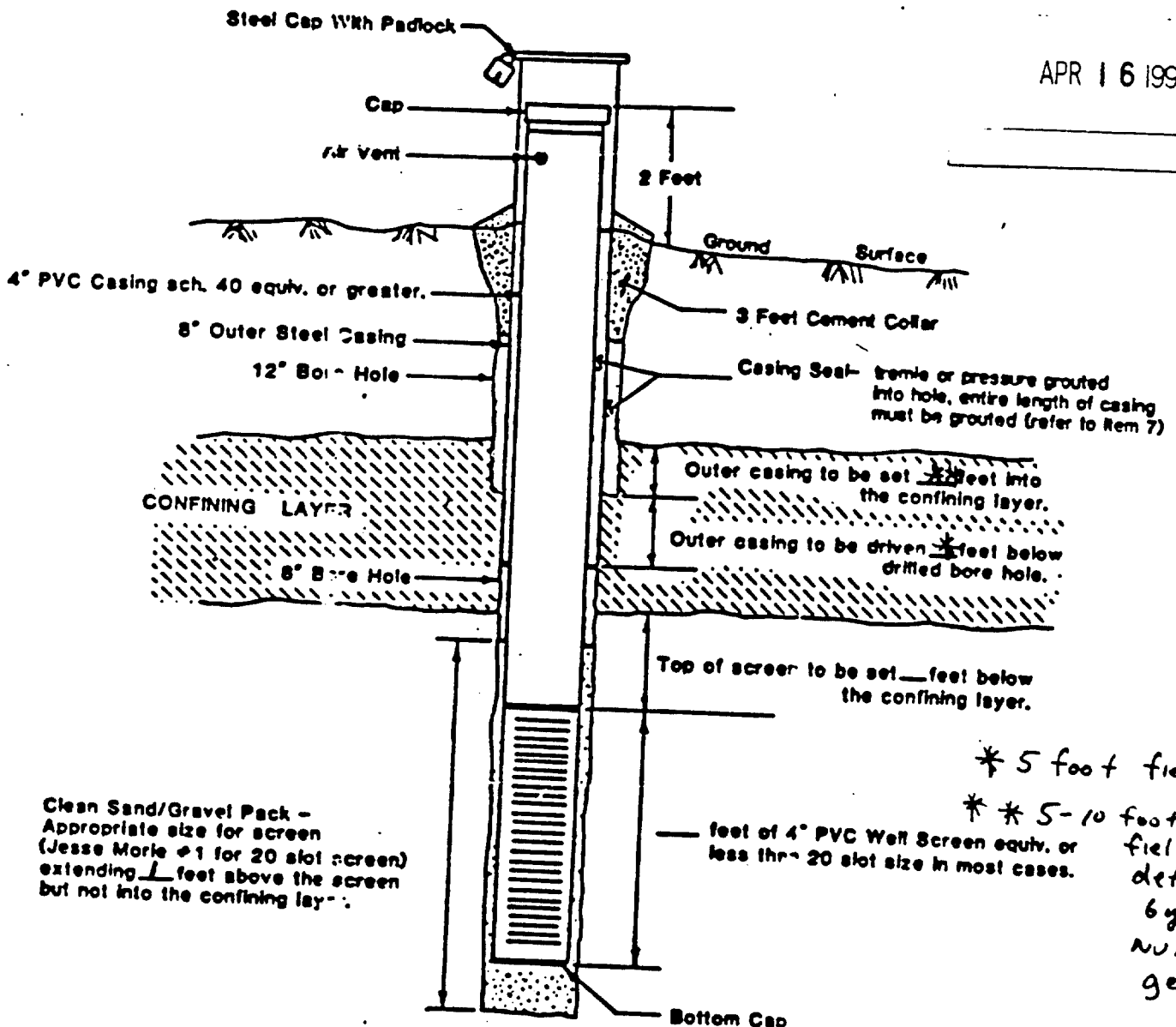
SITE NAME: _____

LOCATION: _____

DATE: _____

DRAFT

APR 16 1990



NOT TO SCALE

850130538

MONITORING WELL REQUIREMENTS FOR CONFINED UNCONSOLIDATED AQUIFERS
Revised 12/87

1. Notification to the NJDEP is required two (2) weeks prior to drilling.
2. State well permits are required for each monitor well constructed by the driller. Report "use of well" on permit application as ground water monitoring. Permit number must be permanently affixed to each monitoring well. NOTE: Well driller must be licensed in the State of New Jersey.
3. All boreholes must be a minimum of four (4) inches greater in diameter than the immediate casing it surrounds.
4. Wells must be gravel packed unless noted otherwise in the Additional Requirements and under no circumstance is the gravel pack to penetrate a confining layer.
5. Casing sealant, drilling fluids and cement must be mixed with potable water.
6. The borehole for the out steel casing is to be drilled and the casing driven, grouted and allowed to set prior to drilling through any confining layer.
7. Acceptable grouting materials are:
 - Neat Cement - 6 gallons of water per 94 pound bag of cement.
 - Granular Bentonite - 1 gallon of water per 1.5 pounds of bentonite.
 - Cement-Bentonite - 8 gallons of water to 5 pounds of bentonite dry mixed per 94 pound bag of cement.
 - Cement-Bentonite - 10 gallons of water per 8 pounds of bentonite water-mixed with a 94 bag of cement.
 - Non-expandable cement - 7.5 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 4 pounds of bentonite and 94 pounds of cement.
 - Non-expandable cement - 7 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 94 pounds of cement (Type I or Type II).
8. The grout for the inner PVC cased well must extend to the ground surface.
9. The cement collar should be installed one (1) hour after the inner casing seal has been emplaced and not while the outer casing seal is setting.
10. All wells must be developed to yield a turbid-free discharge.
11. The driller must maintain an accurate written log of all materials encountered in each hole, record all construction details for each well, the static water levels, and any tidal fluctuations (when applicable). This information must be submitted to the Office of Water Allocation as required by N.J.G.S.A. 58:4A.
12. If organic compounds are to be sampled for, only threaded or press joints (no glue joints) are acceptable.
13. Locking caps must be provided to secure each well.
14. The top of the inner PVC casing (excluding cap) must be surveyed to the nearest hundredth foot (0.01) by a licensed surveyor. The inner casing must be permanently marked at the point surveyed. The well should be numbered clearly on

the outer casing. A detailed site map with the well location and casing elevation must be submitted to _____.

Additional Requirements (if checked):

Split Spoon Samples (X) Continuous

Dedicated Bailer (Sampler) in Well(s) () _____

Threaded or Press Joints () _____

Five (5) Foot Casing Tailpiece Below Screen () _____

Centralizers on Screen () _____

Borehole Geophysical Log(s) () _____

Other (X) Screen size appropriate for formation

OVA or HNA screening on all borings lithologic logs shall

Notice is Hereby Given of the Following: *be maintained using*
Burmeister or
Review by the Department of well locations and depths is limited *unified*
solely to review for compliance with the law and Department *system*
rules.

The Department does not review well locations or depths to ascertain the presence of, nor the potential for, damage to any pipeline, cable, or other structures.

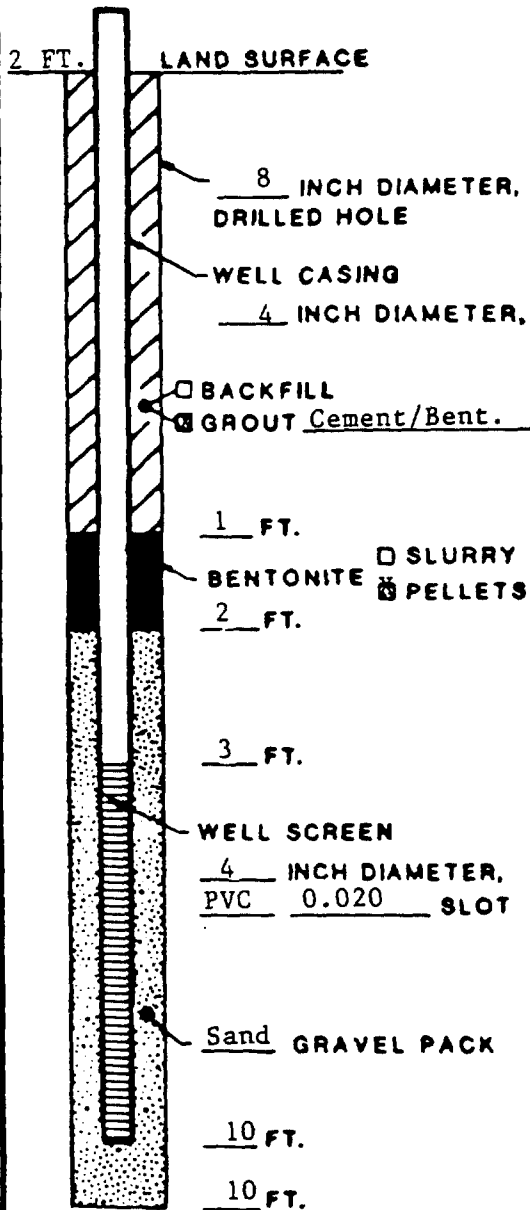
The permittee (applicant) is solely responsible for the safety and adequacy of the design and construction of monitoring well(s) required by the Department.

The permittee (applicant) is solely responsible for any harm or damage to person or property which results from the construction or maintenance of any well; this provision is not intended to relieve third parties of any liabilities or responsibilities which are legally theirs.

APPENDIX C

Construction Details for Shallow Wells.

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-13S PERMIT NO. 26-201381

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM _____ FEET ☐ SURVEYED

☐ ESTIMATED

INSTALLATION DATE(S) 4/30/90

DRILLING METHOD Hollow Stem Auger

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 22.5 GALLONS

STATIC DEPTH TO WATER 5.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.75 HOURS

YIELD 0.5 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

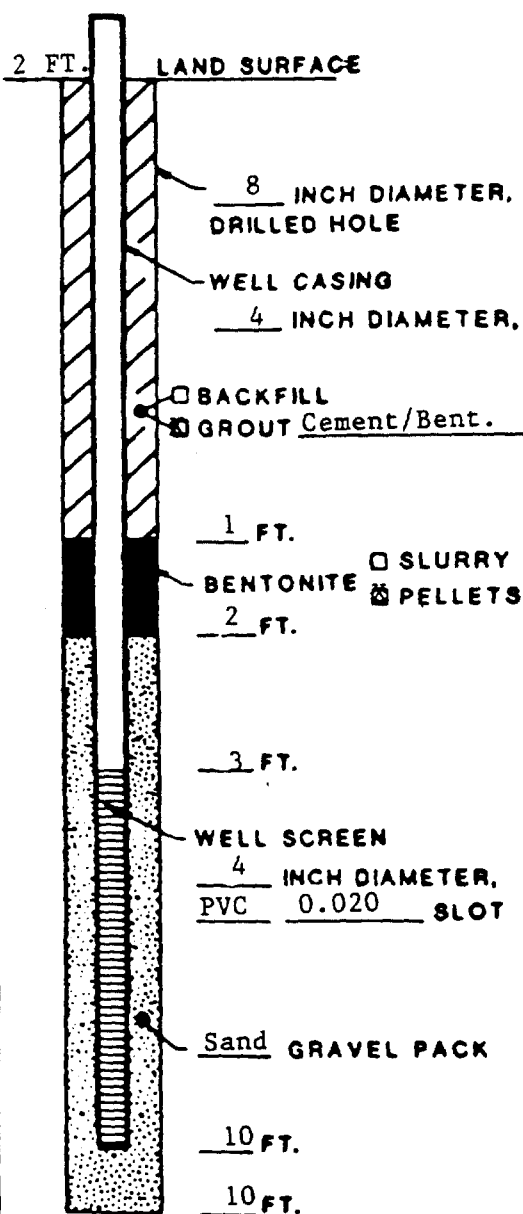
WELL PURPOSE Monitoring Well

REMARKS _____

HYDROGEOLOGIST J. Powley

850130542

MONITORING WELL CONSTRUCTION LOG



NOTE:
 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-14S PERMIT NO. 26-201411

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
 AND DATUM 8.26 FEET ☐ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 4/30/90

DRILLING METHOD Hollow Stem Auger

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 63 GALLONS

STATIC DEPTH TO WATER 5.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.33 HOURS

YIELD 3 GPM 5/18/90 DATE _____

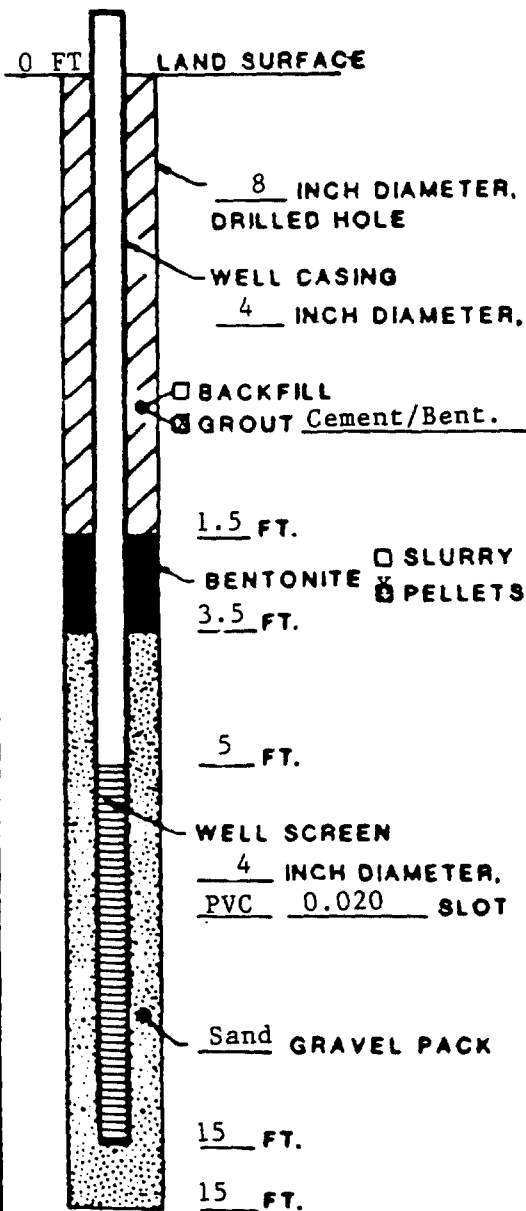
SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS _____

HYDROGEOLOGIST J. Powley

850130543

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACEPROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-15S PERMIT NO. 26-201399TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.98 FEET☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/1/90DRILLING METHOD Hollow Stem AugerDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 62 GALLONSSTATIC DEPTH TO WATER 2.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION _____ HOURS

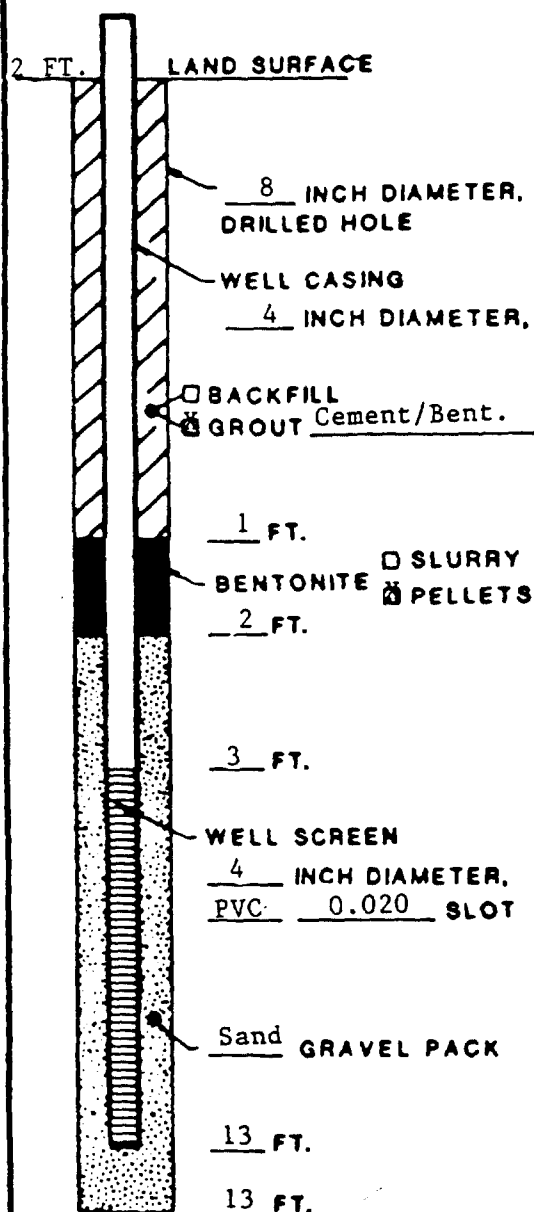
YIELD 1.75 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring WellREMARKS Flush-Mount WellHYDROGEOLOGIST J. Powley

850130544

MONITORING WELL CONSTRUCTION LOG


NOTE:

 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

 PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

 WELL NO. MW-16S PERMIT NO. 26-201402

 TOWN/CITY Kearny

 COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

 AND DATUM 9.31 FEET ☒ SURVEYED

☐ ESTIMATED

 INSTALLATION DATE(S) 5/1/90

 DRILLING METHOD Hollow Stem Auger

 DRILLING CONTRACTOR Empire Soils Investigations

 DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

 WATER REMOVED DURING DEVELOPMENT 135 GALLONS

 STATIC DEPTH TO WATER 5.65 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

 PUMPING DURATION 0.5 HOURS

 YIELD 4.5 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

 WELL PURPOSE Monitoring Well

REMARKS _____

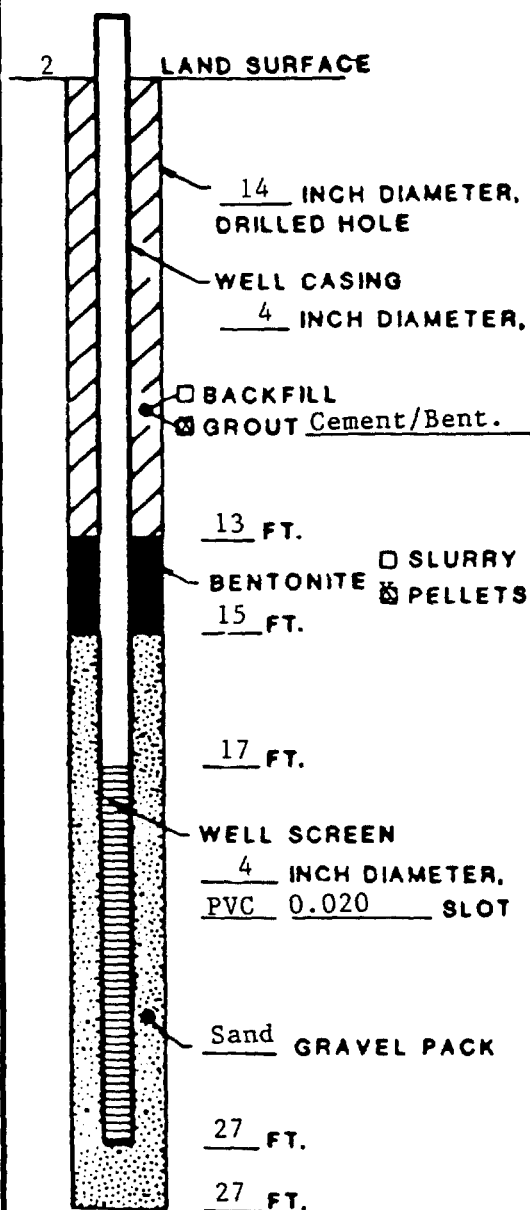
 HYDROGEOLOGIST J. Powley

850130545

APPENDIX D

Construction Details for Deep Wells.

MONITORING WELL CONSTRUCTION LOG



NOTE:
 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

PROJECT NAME Monsant Kearny Plant NUMBER 06606J

WELL NO. MW-8D PERMIT NO. 26-20144-5

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
 AND DATUM 7.58 FEET ☒ SURVEYED
☐ ESTIMATED

INSTALLATION DATE(S) 5/2/90

DRILLING METHOD Empire Soils Investigations

DRILLING CONTRACTOR water

DRILLING FLUID _____

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 96 GALLONS

STATIC DEPTH TO WATER 8.3 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.19 HOURS

YIELD 8 GPM 5/18/90 DATE _____

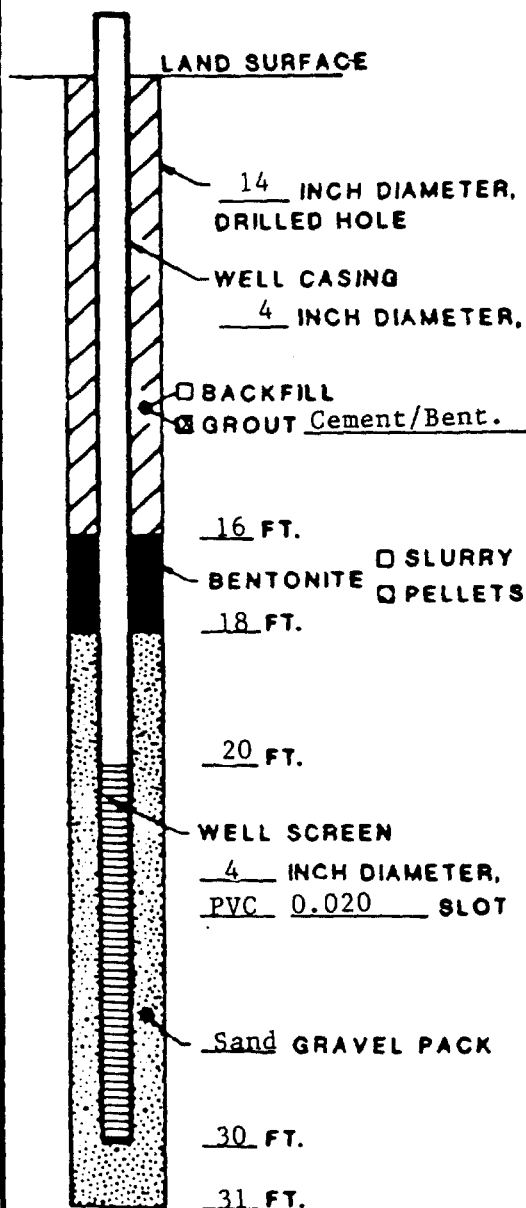
SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 9.5'.

HYDROGEOLOGIST J. Powley

850130547

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-9D PERMIT NO. 26-20145-3TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 9.31 FEET ☐ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/16/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/22/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 112 GALLONSSTATIC DEPTH TO WATER 6.3 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

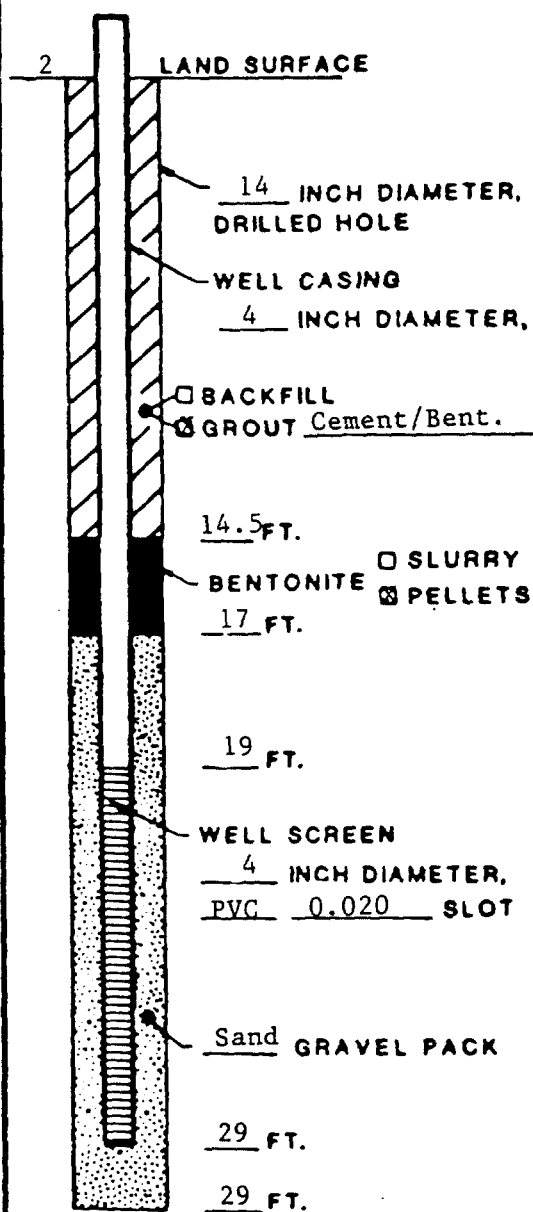
PUMPING DURATION 0.5 HOURSYIELD 4 GPM 5/22/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well - Flush MountREMARKS Double-cased well: 8 inch diameter outer
steel casing to 14.6'.HYDROGEOLOGIST J. Powley

850130548

MONITORING WELL CONSTRUCTION LOG



NOTE:
 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-10D PERMIT NO. 26-20146-1

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION AND DATUM 9.64 FEET ☒ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 5/7/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 170 GALLONS

STATIC DEPTH TO WATER 9.3 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.5 HOURS

YIELD 5.5 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

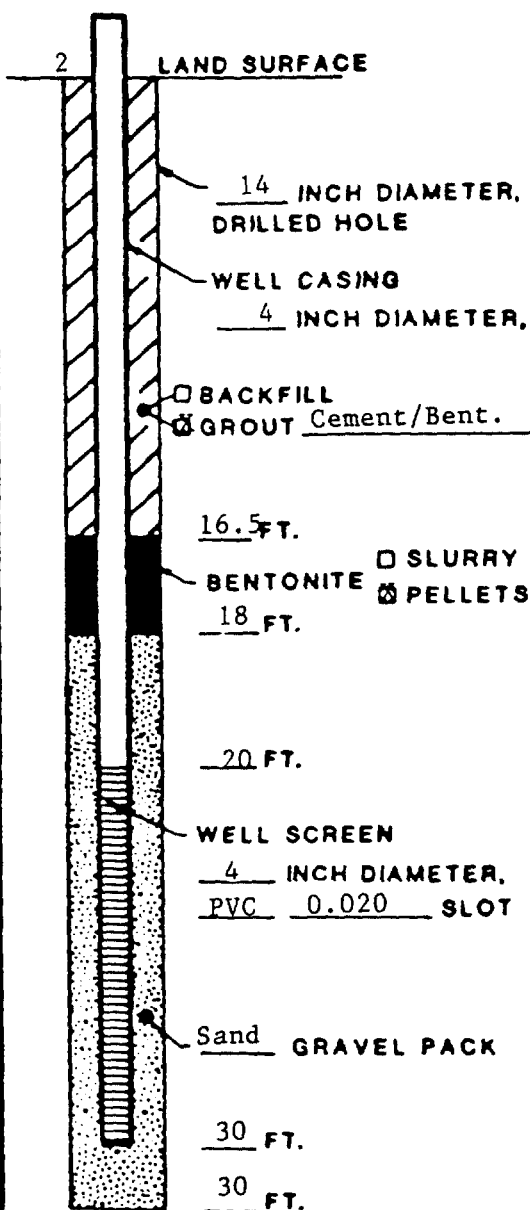
WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 13.5'.

HYDROGEOLOGIST J. Powley

850130549

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

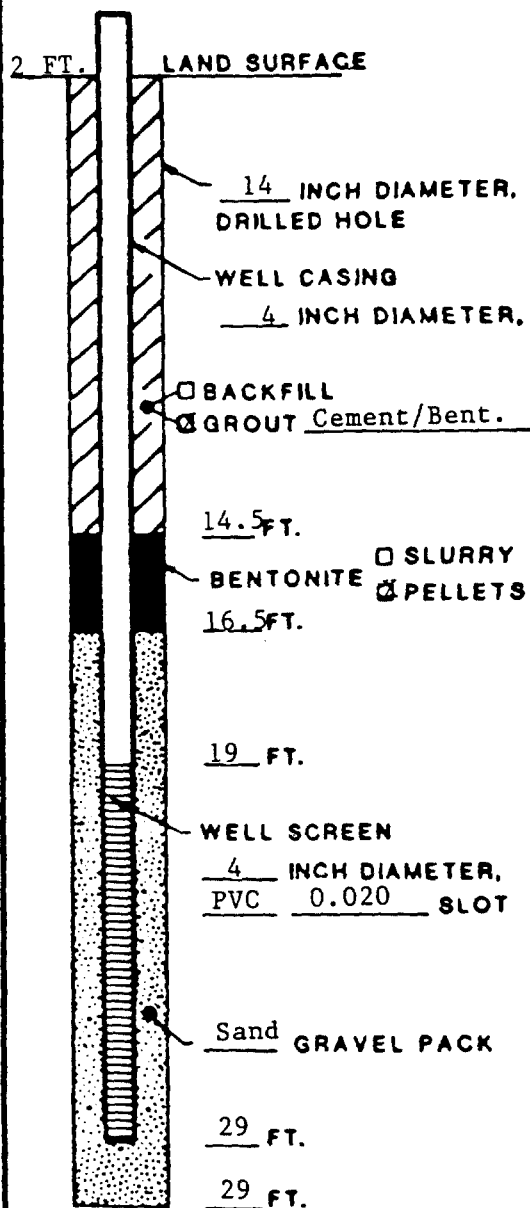
PROJECT NAME Monsanto Kearny Plant NUMBER 06606J
 WELL NO. MW-11D PERMIT NO. 26-20147-0
 TOWN/CITY Kearny
 COUNTY Hudson STATE NJ
 LAND-SURFACE ELEVATION
 AND DATUM 9.12 FEET ☒ SURVEYED ☐ ESTIMATED
 INSTALLATION DATE(S) 5/11/90
 DRILLING METHOD Mud Rotary
 DRILLING CONTRACTOR Empire Soils Investigations
 DRILLING FLUID Water
 DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump 5/21/90
 FLUID LOSS DURING DRILLING _____ GALLONS
 WATER REMOVED DURING DEVELOPMENT 225 GALLONS
 STATIC DEPTH TO WATER 8.75 FEET BELOW M.P.
 PUMPING DEPTH TO WATER _____ FEET BELOW M.P.
 PUMPING DURATION _____ HOURS
 YIELD 9 GPM 5/21/90 DATE _____
 SPECIFIC CAPACITY _____ GPM/FT.
 WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 15.6.

HYDROGEOLOGIST J. Powley

850130550

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-12D PERMIT NO. 26-201488

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION AND DATUM 9.10 FEET ☒ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 5/11/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR _____

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 175 GALLONS

STATIC DEPTH TO WATER 8.85 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.75 HOURS

YIELD 3.5 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

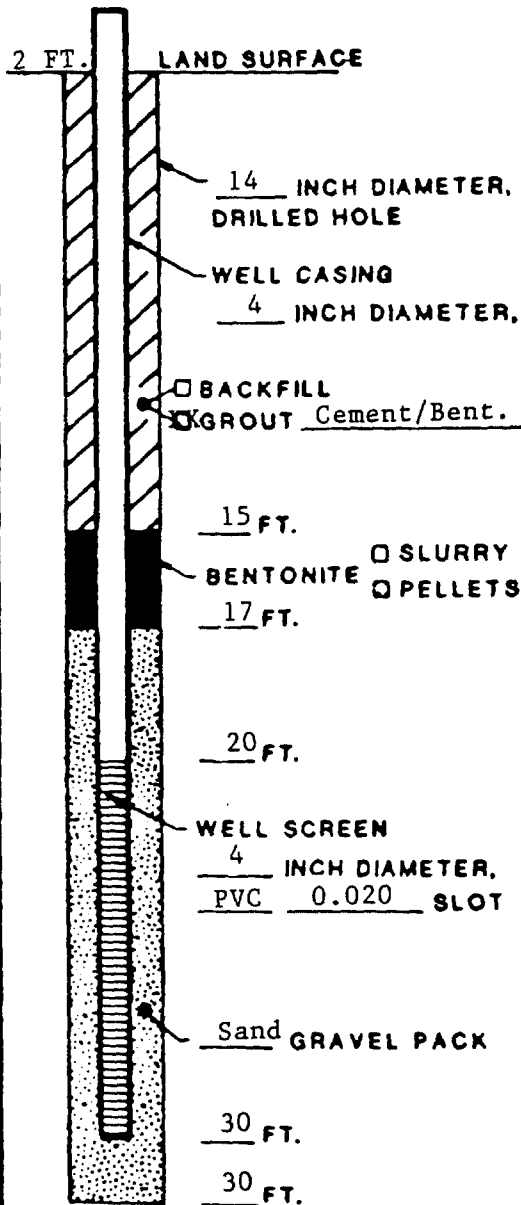
WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter steel outer casing to 15.5'.

HYDROGEOLOGIST J. Powley

850130551

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-13D PERMIT NO. 26-201496

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.39 FEET ☒ SURVEYED

☐ ESTIMATED

INSTALLATION DATE(S) 5/4/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 104 GALLONS

STATIC DEPTH TO WATER 8.45 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.45 HOURS

YIELD 4 GPM 5/17/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

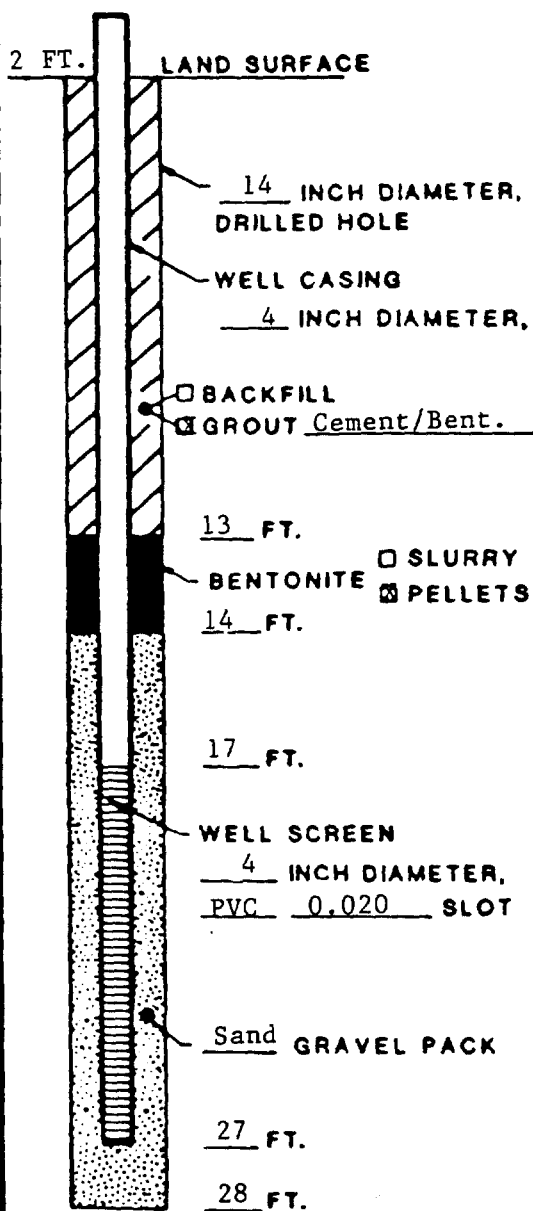
WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter steel outer casing to 8 feet.

HYDROGEOLOGIST J. Powley

850130552

MONITORING WELL CONSTRUCTION LOG


NOTE:

 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

 PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

 WELL NO. MW-14D PERMIT NO. 26-201500

 TOWN/CITY Kearny

 COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

 AND DATUM 8.37 FEET ☒ SURVEYED

☐ ESTIMATED

 INSTALLATION DATE(S) 5/2/90

 DRILLING METHOD Mud Rotary

 DRILLING CONTRACTOR Empire Soils Investigations

 DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

 WATER REMOVED DURING DEVELOPMENT 60 GALLONS

 STATIC DEPTH TO WATER 9.5 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

 PUMPING DURATION 0.25 HOURS

 YIELD 4 GPM 5/17/90 DATE _____

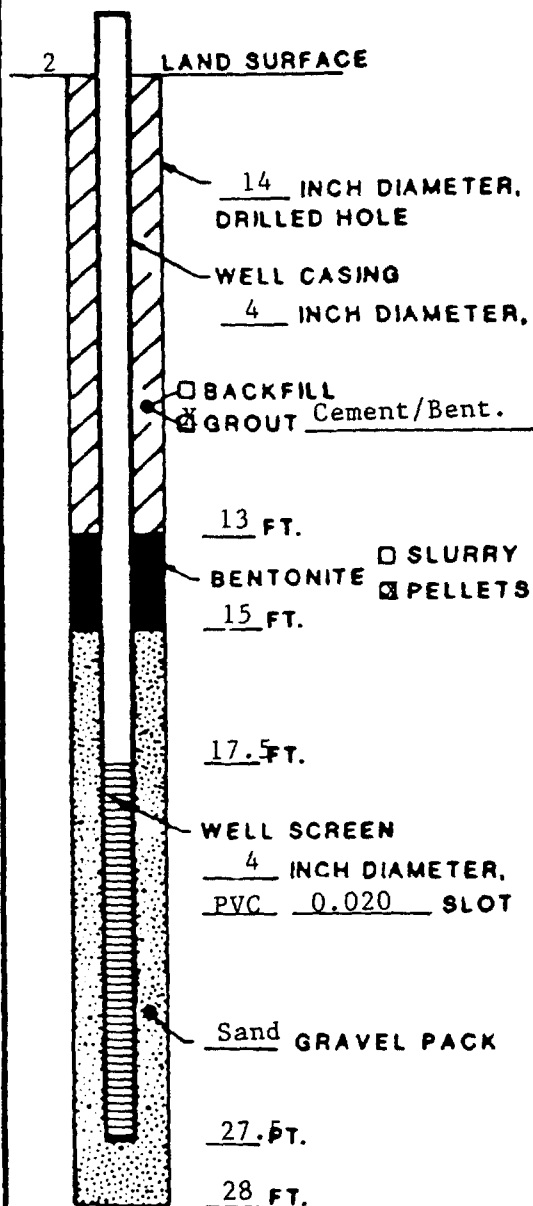
SPECIFIC CAPACITY _____ GPM/FT.

 WELL PURPOSE Monitoring Well

 REMARKS Double-cased well: 8 inch diameter outer steel casing to 11.8'.

 HYDROGEOLOGIST J. Powley

850130553

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-6D PERMIT NO. 26-20142-9

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION AND DATUM 8.53 FEET ☒ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 5/4/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investgation

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 120 GALLONS

STATIC DEPTH TO WATER 9 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.25 HOURS

YIELD 8 GPM 5/18/90 DATE _____

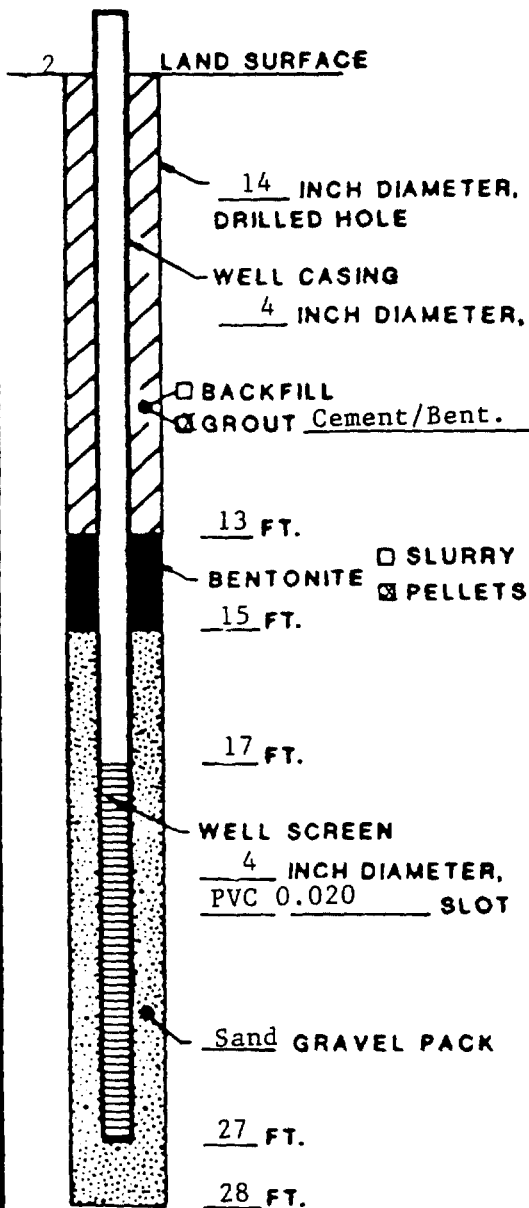
SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 13.25'.

HYDROGEOLOGIST J. Powley

850130554

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-7D PERMIT NO. 26-20143-7

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
AND DATUM 8.53 FEET ☒ SURVEYED
☐ ESTIMATED

INSTALLATION DATE(S) 5/4/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 84 GALLONS

STATIC DEPTH TO WATER 8.35 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.33 HOURS

YIELD 4 GPM 5/17/90 DATE _____

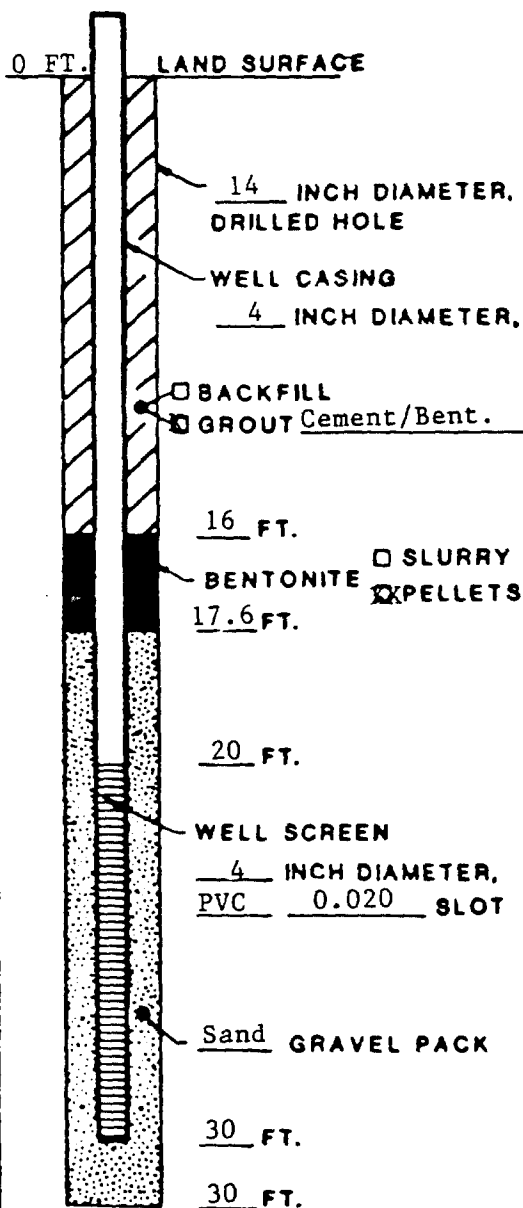
SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Wells

REMARKS Double-cased well: 8 inch diameter outer steel casing to 13.5'.

HYDROGEOLOGIST J. Powley

850130555

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-15D PERMIT NO. 26-201518TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 9.05 FEET☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/3/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 90 GALLONSSTATIC DEPTH TO WATER 6.4 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.25 HOURSYIELD 6 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Flush Mount-Double cased: 8 inch outer
steel casing to 15 feet.

HYDROGEOLOGIST J. Powley

850130556

APPENDIX E

Monitoring Well Certifications - Forms A and B.

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 6278 -
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-06'-50.41"
Latitude (one tenth of a second): North 40°-44'-31.48"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.73'PVC, 11.33'CASING, 11.56'GRND
Owners Well Number (As shown on application
or plans): MW-1

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130558

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 6 2 8 1

Owner's Well Number (As shown on the application or plans):

MW-4S

Well Completion Date:

8-11-83

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.72

Total Depth of Well (one-tenth of a foot):

10.30 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

7.02

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

5.72

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

John L. Loper
Professional Signature

JOHN L. LOPEL
Professional Name
(Please type or print)

SEAL

ENGINEER
Professional License # GE 34148

850130559

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 6 2 8 0

Owner's Well Number (As shown on the application or plans):

MW-5S

Well Completion Date:

8-11-83

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.89

Total Depth of Well (one-tenth of a foot):

9.10 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

6.99

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

6.45

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

John A. Loper
Professional Signature

John A. Loper
Professional Name
(Please type or print)

SEAL

ENGINEER
Professional License # GE 34148

850130560

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:


LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 6279 -
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-09.54"
Latitude (one tenth of a second): North 40°-44'-33.03"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.23'PVC, 11.75'CASING, 9.20'GRND
Owners Well Number (As shown on application
or plans): MW-6S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130561

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 6 2 7 9

Owner's Well Number (As shown on the application or plans):

MW-6S

Well Completion Date:

8-11-83

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.03

Total Depth of Well (one-tenth of a foot):

10.60 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

7.63

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

6.08

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LOPEZ

Professional Name
(Please type or print)

SEAL

ENGINEER GE 34148
Professional License #

850130562

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 6 2 7 8

Owner's Well Number (As shown on the application or plans):

MW-1S

Well Completion Date:

8-11-83

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

-0.83

Total Depth of Well (one-tenth of a foot):

12.83 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

7.00

Screen Length (feet):

5.00

Screen or Slot Size:

Not Indicated

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

4.17

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional

Signature

JOHN A. LOPER

Professional

Name

(Please type or print)

SEAL

ENGINEER

GE 34148

Professional

License #

MW-15

4 Temple Place • P.O. Box 57
National Park, New Jersey 08063
609-845-8780

Client **Monsanto**

Date 8-11-83

Project : Monsanto-Rearny

Job No. 679

Boring No. OW-4 Sheet No. 1

Sheet No. 1 of 1

Ground Surface Elev.

11 S - 2" O.D. Split Spoon Sample
 U - Undisturbed Sample, 3" Diameter
 C - Core Drilling
 N - Standard Penetration Resistance per 6"
 (140 lb Hammer, 30" drop)

Driller R. Barber

850130564

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

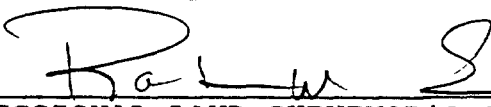
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831):
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-00.63"
Latitude (one tenth of a second): North 40°-44'-30.51"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.56'PVC, 11.25'CASING, 8.98'GRND
Owners Well Number (As shown on application
or plans): MW-3S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130565

Hp Drilling, Inc.

MW-45

4 Temple Place • P.O. Box 57
National Park, New Jersey 08063
609-845-6780

TEST BORINGS - WATER WELLS - PERCOLATION TESTS - 0 - MONITORING WELLS

Client Monsanto

Date 8-12-83

Project Monsanto-Kearny

Job No. 679

Boring No. OW-5 Sheet No. 1 of 1

Ground Surface Elev.

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | DEPTH |
|-------------------|------|------|----------------------------|--------|----------|
| DEPTH | HOUR | DATE | A | Rotary | 0 TO 10' |
| 6" | | | | | TO |
| | | | | | TO |

| DEPTH | CASING BLOWS | SAMPLE | | | SOIL CLASSIFICATION | DEPTH |
|-------|--------------|--------|-------|----------|----------------------------------------------------------------------------|-------|
| | | NO. | DEPTH | N | | |
| 5' | | S-1 | 0-2 | 9-9-4-4 | Med. dense wet brn. C/F sand & C/F gravel and cinders tr. wood, silt, clay | 6' |
| | | S-2 | 2-4 | 9-8-5-4 | | |
| | | S-3 | 4-6 | 5-9-11-9 | | |
| 10' | | S-4 | 6-8 | 5-4-4-6 | Loose wet brn. C/F sand, tr. fine gravel | 10' |
| | | S-5 | 8-10 | 6-7-6-3 | | |
| 15' | | | | | Med. dense wet | |
| | | | | | | |
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| | | | | | Test Boring Complete at 10' | |
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| | | | | | | |

☐ S - 2" O.D. Split Spoon Sample
☐ U - Undisturbed Sample, 3" Diameter
☒ - Core Drilling
 N - Standard Penetration Resistance per S" (140° hammer, 30" drop)

Driller R. Barber

Helper J. Smith

850130566

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

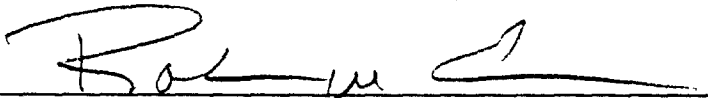
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 6289 -
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-00.40"
Latitude (one tenth of a second): North 40°-44'-33.02"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.55'PVC, 12.12'CASING, 9.83'GRND
Owners Well Number (As shown on application
or plans): MW-4S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130567

MW-55

4 Temple Place • P.O. Box 57
National Park, New Jersey 08063
609-845-6780

| | | | | | | |
|------------|---|-------------|---|-------------------|---|------------------|
| ST BORINGS | - | WATER WELLS | - | PERCOLATION TESTS | - | MONITORING WELLS |
|------------|---|-------------|---|-------------------|---|------------------|

Quest Monsanto

Date 8-11-83

Subject Monsanto-Kearney

Job No. 679

Ring No. OW-3 Sheet No. 1 of 1 Ground Surface Elev.

Ground Surface Elev.

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | DEPTH | |
|-------------------|------|------|----------------------------|--------|-------|--------|
| DEPTH | HOUR | DATE | A | Rotary | 0 | TO 12' |
| 60" | | | | | | TO |
| | | | | | | TO |

[illegible]

113 - 2" O.D. Split Spoon Sample

■ U - Undisturbed Sample, 3" Diameter

- Core Drilling

N - Standard Penetration Resistance per 6"
(140° hammer, 30" drop)

N.R. - No Recovery

Driller R. Barber

850130568

Helper J. Smith

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

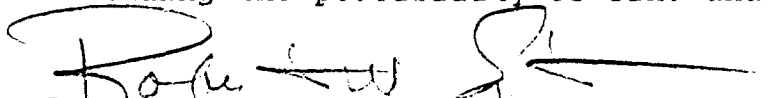
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 6280 -
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-05.35"
Latitude (one tenth of a second): North 40°-44'-33.46"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.81'PVC, 12.50'CASING, 8.92'GRND
Owners Well Number (As shown on application
or plans): MW-5S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130569

Hp Drilling, Inc.

MW-65

4 Temple Place • P.O. Box 57
National Park, New Jersey 08063
609-845-6780

TEST BORINGS - WATER WELLS - PERCOLATION TESTS - MONITORING WELLS

Client **Monsanto** Date **8-11-83**
Project **Monsanto-Kearney** Job No. **679**
Boring No. **OW-1** Sheet No. **1** of **1** Ground Surface Elev.

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | DEPTH | |
|-------------------|--------------|--------|----------------------------|---------|-------------------------------------------------------------------------|-------|
| DEPTH | HOUR | DATE | A | Rotary | 0-TO 10' | |
| 34" | | | | | TO | |
| | | | | | TO | |
| DEPTH | CASING BLOWS | SAMPLE | | | SOIL CLASSIFICATION | DEPTH |
| | | NO. | DEPTH | N | | |
| 5' | | S-1 | 0-2 | 4-2-2-1 | Loose damp dk. brn. C/F sand & cinders, Some M/F gravel, Tr. silt, wood | 4' |
| | | S-2 | 2-4 | 3-3-2-3 | | |
| | | S-3 | 4-6 | 3-5-5-6 | Med. dense wet brn. to dk. gray M/F sand Tr. coarse sand, Tr. silt | 8.5' |
| | | S-4 | 6-8 | 4-2-3-6 | Loose wet | |
| 10' | | S-5 | 8-10 | 3-2-2-4 | Stiff moist gray clayey silt w/small fine silty sand lenses | 10' |
| 15' | | | | | Test Boring Complete at 10' | |

☒ S - 2" O.D. Split Spoon Sample
☐ U - Undisturbed Sample, 3" Diameter
☐ C - Core Drilling
 N - Standard Penetration Resistance per 6" (140# hammer, 30" drop)

Driller R. Barber 850130570

Helper J. Smith

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsant Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 6282 -
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-06.61"
Latitude (one tenth of a second): North 40°44'-30.54"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.37'PVC, 10.76'CASING, 8.40'GRND
Owners Well Number (As shown on application
or plans): MW-7S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130571

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 6 2 8 2

Owner's Well Number (As shown on the application or plans):

MW-7S

Well Completion Date:

8-11-83

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.36

Total Depth of Well (one-tenth of a foot):

9.64 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

7.00

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

4.25

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

John A. Loper
Professional Signature

JOHN A. LOPEL
Professional Name
(Please type or print)

SEAL

ENGINEER
Professional License # GE 34148

850130572

Hp Drilling, Inc.

MW-75

4 Temple Place • P.O. Box 57
National Park, New Jersey 08063
609-845-8780

as per diagram

TEST BORINGS - WATER WELLS - PERCOLATION TESTS - MONITORING WELLS

Client **Monsanto**

Date **8-11-83**

Project **Monsanto-Kearney**

Job No. **679**

Boring No. **OW-2** Sheet No. **1** of **1**

Ground Surface Elev.

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | | DEPTH |
|-------------------|--------------|--------|----------------------------|-------------|---------------------------------------------------------------------------|----------|
| DEPTH | HOUR | DATE | A | Rotary | | 0 TO 12' |
| 46" | | | | | | TO |
| | | | | | | TO |
| DEPTH | CASING BLOWS | SAMPLE | | | SOIL CLASSIFICATION | DEPTH |
| | | NO. | DEPTH | N | | |
| 5' | | S-1 | 0-2 | 11-13-13-10 | Gravel
Brn. damp C/f sand, Some C/F
gravel, cinders, wood, tr. silt | 6" |
| | | S-2 | 2-4 | 12-7-7-8 | | 4' |
| | | S-3 | 4-6 | 8-7-6-9 | Med. dense wet brn. to gray M/F
sand Tr. coarse sand, tr. silt | |
| | | S-4 | 6-8 | 5-6-6-3 | Med. dense wet | |
| 10' | | S-5 | 8-10 | 1-2-2-4 | Loose wet | |
| | | S-6 | 10-12 | 3-3-4-4 | Loose wet | 12' |
| 15' | | | | | Test Boring Complete at 12' | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |

☒ S - 2" O.D. Split Spoon Sample
☐ U - Undisturbed Sample, 3" Diameter
☐ C - Core Drilling
 N - Standard Penetration Resistance per 6"
 (140# hammer, 30" drop)

Driller R. Barber

850130573

Helper J. Smith

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

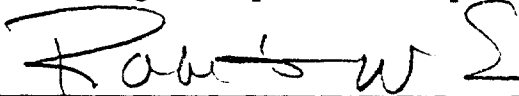
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831):
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-03.38"
Latitude (one tenth of a second): North 40°44'-26.59"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 8.83'PVC, 9.36'CASING, 7.15'GRND
Owners Well Number (As shown on application
or plans): MW-8S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130574

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 7 0 3 7 9 S

Owner's Well Number (As shown on the application or plans):

MW-9S

Well Completion Date:

9-26-84

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.26

Total Depth of Well (one-tenth of a foot):

15.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

11.26

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

5.04

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN A. LOPEZ

Professional Name
(Please type or print)

SEAL

ENGINEER GE 34148
Professional License #

850130575

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Monsanto - 2101
 SITE Kearny, New Jersey
 COORDINATES _____
 DATE COMPLETED 9/26/84
 SUPERVISED BY M. Glaze, R. Beckwith

O.H. MATERIALS CO.
O H M
 THE ENVIRONMENTAL
 SERVICES COMPANY

WELL NO. 9S

AQUIFER _____

DRAWING NO.

2101 A-748-R

DATE

BY

REVISIONS

CHECKED BY/DATE

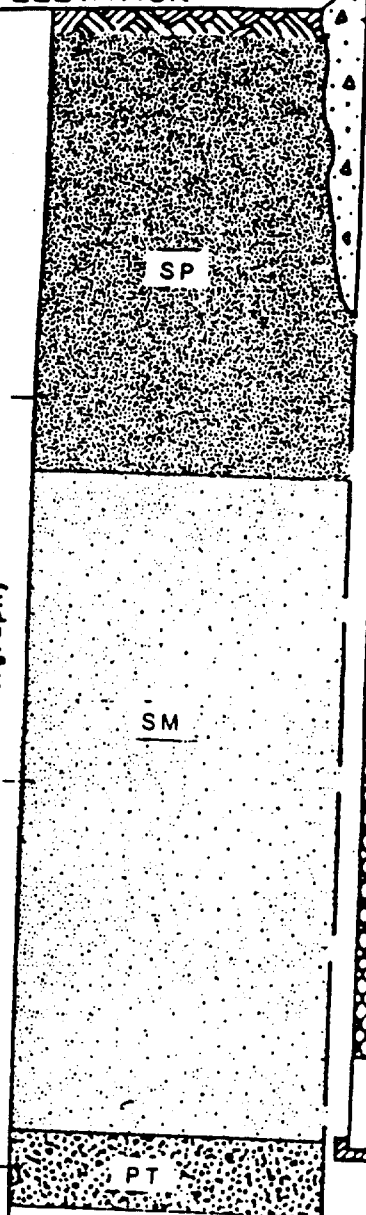
APPROVED BY/DATE

DRAWN BY

DATE

Generalized Stratigraphy

GROUND
ELEVATION



Elevation of reference point _____

Height of reference point above ground surface _____

Depth of surface seal _____

2 feet

Type of surface seal: Portland cement

I. D. of surface casing _____

N/A

Type of surface casing: N/A

Depth of surface casing _____

N/A

I. D. of riser pipe _____

4 inches

Type of riser pipe: schedule 40 PVC

Diameter of borehole _____

12 inches

Type of filler: Natural Soil

Elevation / depth of top of seal _____

3 feet

Type of seal: Bentonite

Type of gravel pack Silica sand

Elev. / depth of top of gravel pack _____

5 feet

Elevation / depth of top of screen _____

10 feet

Description of screen: .020 slot

schedule 40 PVC

I. D. of screen section _____

4 inches

Elevation / depth of bottom of screen _____

15 feet

Elev. / depth of bottom of gravel pack _____

15 feet

Elev. / depth of bottom of plugged blank section _____

Type of filler below plugged section: N/A

Elevation of bottom of borehole _____

850130576

PROJECT NAME Monsanto Kearny, NJPROJECT NO. 2101 BORING NO. 9Db

DRILLER: OHM

LOGGED BY MG DATE 10-05-84SURFACE ELEV. _____ PAGE 1 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|-----|--------------------------|--------|---------------------------|---------------|---------|----------|----------|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | 18
24 | | | |
| 2.0 | | - SPLIT SPOON SAMPLING - | 1 | 0.0-2.0 | 9 | 18 | 26 | 35 | | | Fill: sands and gravels, fine to coarse grained, brown to black color

(SM/SP) |
| 4.0 | | | 2 | 2.0-4.0 | 12 | 23 | 41 | 67 | | | Fill: sands and gravels, fine to coarse grained, brown to black color

(SM/SP) |
| 6.0 | | | 3 | 4.0-6.0 | 28 | 60 | 80 | 108 | | | Fill: sands and gravels, fine to coarse grained, brown to black color

(SM/SP) |
| 8.0 | | | 4 | 6.0-8.0 | 15 | 29 | 57 | 90 | | | Silty sand: Fine to medium grain odor present, brown color

(SM) |
| 10.0 | | | 5 | 8.0-10.0 | 19 | 35 | 55 | 75 | | | Silty sand: fine to medium grained becoming coarse sand at 9.0 ft., uniformly graded, grayish brown |
| 12.0 | | | 6 | 10.0-12.0 | 8 | 15 | 33 | 46 | | | Sand: medium grained with mixed silts, grading to coarser sand at 11 ft., poorly sorted, slight odor

(SM) |
| 14.0 | | | 7 | 12.0-14.0 | 4 | 10 | 14 | 17 | | | Sand: fine to coarse grained about 60 percent fine, 20 percent medium, 20 percent coarse grained; clean, grading to coarser sands at 14.0 ft. |
| 15.0 | | | | | | | | | | | |

- SPLIT SPOON SAMPLING -

850130577

DRILLER: OHM

BORING LOG

PROJECT NAME Monsanto/Hearnv, MS PROJECT NO. 2101 BORING NO. 9DbLOGGED BY MG DATE 9-28-84 SURFACE ELEV. _____ PAGE 2 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|-----|--------|--------|---------------------------|---------------|---------|----------|----------|---------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | 18
24 | | | |
| 16.0 | | | 8 | 14.0-16.0 | 3 | 7 | 9 | 14 | | | Sand: medium to coarse grained to 14.75 ft., grading to fine gray brown silt at 15.75 feet abrupt change to black organic calvey silt, organ odor
(OL-OH) |
| 18.0 | | | 9 | 16.0-18.0 | 2 | 5 | 9 | 16 | | | Peat: black fibrous material to 18 ft., changing over 1.0 ft. interval to fine gray silty sand, moderate to high plasticity
(PT/CH) |
| 20.0 | | | 10 | 18.0-20.0 | 6 | 11 | 17 | 25 | | | Silty sand: fine grained, gray color
(SM) |
| 22.0 | | | 11 | 20.0-22.0 | 15 | 28 | 43 | 62 | | | Silty sand: fine grained, gray color
(SM) |
| 24.0 | | | 12 | 22.0-24.0 | 7 | 14 | 23 | 34 | | | Silty sand: very fine to fine grain grading to medium to coarse grained at 23.5 ft., odor, gray color
(SM) |
| 26.0 | | | 13 | 24.0-26.0 | 16 | 33 | 56 | 82 | | | Silty sand: fine to coarse grained, some gravels present, dark reddish brown color
(SM) |
| 28.0 | | | 14 | 26.0-28.0 | 12 | 29 | 45 | 68 | | | Sand: fine to coarse grained, becoming coarser to 27 ft., then finer to 28 ft., dark reddish brown, changing to varved clayey silt at 28 ft.
(SM/CH) |
| 30.0 | | | 15 | 28.0-30.0 | | | | | | | Clayey silt: moderate plasticity, reddish color
(CH) |

B.O.H.

850130578

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

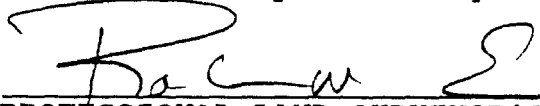
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 7037 - 9S
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-02.12"
Latitude (one tenth of a second): North 40°44'-32.47"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.88'PVC, 11.42'CASING, 9.59'GRND
Owners Well Number (As shown on application
or plans): MW-9S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130579

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 7 0 3 9 1 0

Owner's Well Number (As shown on the application or plans):

MW-10S

Well Completion Date:

9-28-84

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

0.69

Total Depth of Well (one-tenth of a foot):

15.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

10.69

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The Time of Certification (one-hundredth of a foot):

5.86

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 24 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

Professional Name
(Please type or print)

SEAL

Professional License #

850130580

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Monsanto - 2101

SITE Kearny, New Jersey

COORDINATES _____

DATE COMPLETED 9/28/84

SUPERVISED BY M. Glaze, R. Beckwith

O.H. MATERIALS CO.

O H M

THE ENVIRONMENTAL
SERVICES COMPANY

WELL NO. 105

AQUIFER _____

DRAWING NO. 2101 A-748-T

DATE

BY

GROUND
ELEVATION

SM/SP

SM

Generalized Stratigraphy

Elevation of reference point _____

Height of reference point above
ground surface _____

Depth of surface seal _____

2 feet

Type of surface seal: Portland cement

I. D. of surface casing _____

N/A

Type of surface casing: N/A

Depth of surface casing _____

N/A

I. D. of riser pipe _____

4 inch

Type of riser pipe: Schedule 40 PVC

Diameter of borehole _____

12 inch

Type of filler: Natural Soil

Elevation / depth of top of seal _____

3 feet

Type of seal: Bentonite

Type of gravel pack Silica sand

Elev./depth of top of gravel pack _____

5 feet

Elevation / depth of top of screen _____

10 feet

Description of screen: .020 slot

Schedule 40 PVC

I. D. of screen section _____

4 inches

Elevation / depth of bottom of screen _____

15 feet

Elev. / depth of bottom of gravel pack _____

15 feet

Elev. / depth of bottom of plugged
blank section _____

Type of filler below plugged
section N/A

Elevation of bottom of borehole _____

850130581

BORING LOG DRILLER: OHM

PROJECT NAME Monsanto Hearn, NJ PROJECT NO. 2101 BORING NO. 101

LOGGED BY MG DATE 9-28-84 SURFACE ELEV. _____ PAGE 1 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|-----|----------------|--------|---------------------------|---------------|---------|----------|----------|---------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | 18
24 | | | |
| 2.0 | | - SPIT SPOON - | 1 | 0.0-2.0 | 3 | 9 | 17 | 22 | | | Fill: sands and gravels, aggregate
slight odor, black

(SM/SP) |
| 4.0 | | | | | | | | | | | |
| 6.0 | | | | | | | | | | | |
| 8.0 | | | 2 | 7.0-9.0 | 4 | 15 | 13 | 43 | | | Fill: sands and gravels to 8.5 ft.,
black (SM/SP)
Silty sand: poorly sorted, slight
odor, gray and brown color
(SM) |
| 10.0 | | | | | | | | | | | |
| 12.0 | | | | | | | | | | | |
| 14.0 | | | | | | | | | | | |
| | | | 3 | 4.0-16.0 | 1 | 2 | 4 | 7 | | | Peat: continuous, some silt present
fibrous, dark brown

(Pt) |

850130582

PROJECT NAME Monsanto/Kearny, NJ PROJECT NO. 2101 BORING NO. 111LOGGED BY MG DATE 9-28-84 SURFACE ELEV. PAGE 2 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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|---------------------------|---------------|---------|----------|----------|---------------|------------------|-------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | 18
24 | | | |
| 16.0

< | | | | | | | | | | | |

B.O.H.

Note: 1st attempt at shelly tube
recovery failed, second attempt
successful

850130583

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

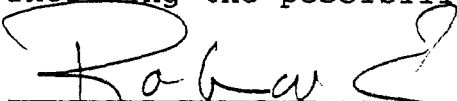
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 7039 - 10S
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-01.74"
Latitude (one tenth of a second): North 40°-44'-33.31"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.65'PVC, 12.15'CASING, 9.96'GRND
Owners Well Number (As shown on application
or plans): MW-10S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130584

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 7 0 4 1 1 1

Owner's Well Number (As shown on the application or plans):

MW-11S

Well Completion Date:

9-27-84

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

0.97

Total Depth of Well (one-tenth of a foot):

14.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

9.97

Screen Length (feet):

5.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

4.54

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 24 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN L. LOPKA

Professional Name
(Please type or print)

ENGINEER

CE 34148

Professional License #

SEAL

850130585

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Monsanto-2101
SITE Kearny, NJ

COORDINATES _____

DATE COMPLETED 9/27/84

SUPERVISED BY M. Glaze, R. Beckwith

OHL MATERIALS CO.

O H M

THE ENVIRONMENTAL
SERVICES COMPANY

WELL NO. 11S

AQUIFER _____

DRAWING NO.

2101 A-748-V

DATE

BY

REVISIONS

CHECKED BY/DATE

APPROVED BY/DATE

DRAWN BY

DATE

Generalized Stratigraphy

GROUND
ELEVATION

SP

SM

PT

Elevation of reference point _____

Height of reference point above
ground surface _____

Depth of surface seal _____

2 ft.

Type of surface seal: Portland
cement

I. D. of surface casing _____

Type of surface casing: N/A

N/A

Depth of surface casing _____

N/A

I. D. of riser pipe _____

4 ft.

Type of riser pipe: Schedule 40 PVC

Diameter of borehole _____

12 in.

Type of filler: Natural Soil

Elevation / depth of top of seal _____

2 ft.

Type of seal: Bentonite

Type of gravel pack Silica Sand

Elev./depth of top of gravel pack _____

4 ft.

Elevation / depth of top of screen _____

9 ft.

Description of screen .020 slot
schedule 40 PVC

I. D. of screen section _____

4 ft.

Elevation / depth of bottom of screen _____

14 ft.

Elev. / depth of bottom of gravel pack
Elev. / depth of bottom of plugged
blank section _____

14 ft.

Type of filler below plugged
section N/A

Elevation of bottom of borehole _____

850130586

BORING LOG

DRILLER: OHM

PROJECT NAME Monsanto/Kearny, NJ PROJECT NO. 2101 BORING NO. 111LOGGED BY MG DATE 9-27-84 SURFACE ELEV. _____ PAGE 1 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
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| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | 18
24 | | | |
| 2.0

 | | | | | | | | | | | |

850130587

DRILLER: OHM

BORING LOG

PROJECT NAME Monsanto/Kearny, NJ PROJECT NO. 2101 BORING NO. 111LOGGED BY MG DATE 9-27-84 SURFACE ELEV. PAGE 2 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|-----|-----------------|--------|---------------------------|---------------|---------|----------|----------|---------------|------------------|-----------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | 18
24 | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | | | | |
| 16.0 | | - SPLIT SPOON - | | | | | | | | | |
| 18.0 | | | 4 | 21.0-23.0 | 3 | 9 | 22 | 39 | | | Silty sand: fine to medium grained,
grayish brown color, occasional
pebbles |
| 20.0 | | | | | | | | | | | (SM) |
| 22.0 | | | | | | | | | | | |
| 24.0 | | | | | | | | | | | |
| 26.0 | | | | | | | | | | | |
| 28.0 | | | | | | | | | | | |
| 30.0 | | SHELBY
TUBE | 5 | 23.0-30.0 | | | | | | | Silt: low plasticity, gray color |
| | | | | | | | | | | | (ML) |

850130588

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 7041 - 11S
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-03.96"
Latitude (one tenth of a second): North 40°-44'-31.39"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 9.97'PVC, 10.87'CASING, 9.00'GRND
Owners Well Number (As shown on application
or plans): MW-11S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130589

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 7 0 4 2 1 2

Owner's Well Number (As shown on the application or plans):

MW-12S

Well Completion Date:

10-03-84

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.13

Total Depth of Well (one-tenth of a foot):

15.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

6.13

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

4.75

Yield (Gallons per Minute):

1 GPM

Length of time Well Pumped or Bailed:

Hours 28 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

John R. Lopez Signature

JOHN R. LOPEZ
Professional Name
(Please type or print)

SEAL

ENGINEER GE 34148
Professional License #

850130590

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Monsanto - 2101
SITE Kearny, New Jersey

COORDINATES _____

DATE COMPLETED 10/03/84

SUPERVISED BY M. Glaze, R. Beckwith

O.H. MATERIALS CO.

O H M

THE ENVIRONMENTAL
SERVICES COMPANY

WELL NO. 12 S

AQUIFER _____

DRAWING NO.

2101 A-748-X

DATE

BY

REVISIONS

CHECKED BY/DATE

APPROVED BY/DATE

DRAWN BY

DATE 1/17/85

GROUND
ELEVATION

Generalized Stratigraphy

SP

SM

PT

Elevation of reference point _____

Height of reference point above
ground surface _____

Depth of surface seal 2 feet

Type of surface seal: Portland cement

I. D. of surface casing N/A

Type of surface casing: N/A

Depth of surface casing N/A

I. D. of riser pipe 4 inches

Type of riser pipe: Schedule 40 PVC

Diameter of borehole 12 inches

Type of filler: Natural soil

Elevation / depth of top of seal 3 feet

Type of seal: Bentonite

Type of gravel pack Silica sand 5 feet

Elev./depth of top of gravel pack

Elevation / depth of top of screen 10 feet

Description of screen .020 slot
schedule 40 PVC

I. D. of screen section 4 inches

Elevation / depth of bottom of screen 15 feet

Elev. / depth of bottom of gravel pack 15 feet

Elev. / depth of bottom of plugged
blank section _____

Type of filler below plugged
section N/A

Elevation of bottom of borehole _____

850130591

BORING LOG

DRILLER: OHM

PROJECT NAME Monsanto/Kearny, NJ PROJECT NO. 2101 BORING NO. 12dLOGGED BY MG DATE 10-02-84 SURFACE ELEV. _____ PAGE 1 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
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-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------|--------|---------------------------|---------------|---------|----------|----------|---------------|------------------|-------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | 18
24 | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0
6 | 6
12 | 12
18 | | | | |
| 2.0

< | | | | | | | | | | | |

850130592

BORING LOG

DRILLER: OHM

PROJECT NAME Monsanto/Kearny, NJ PROJECT NO. 2101 BORING NO. 12dLOGGED BY MG DATE 10-02-84 SURFACE ELEV. _____ PAGE 2 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|----------------|-----------------|-----------|---------------------------|---------------|------|-------|-------|---------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0-6 | 6-12 | 12-18 | 18-24 | | | |
| 16.0 | | - SPLIT SPOON - | 3 | | | | | | | | Peat |
| 18.0 | | | | | | | | | | | |
| 20.0 | | | | | | | | | | | |
| 22.0 | | | 4 | 21.0-23.0 | | 8 | 16 | 24 | 32 | | Silty sand: some organic material, color changing from gray to brown, grading to clayey sand at 22.5 ft., sand is clean angular. |
| 24.0 | | | | | | | | | | | |
| 26.0 | | | | | | | | | | | |
| 28.0 | | | | | | | | | | | |
| 30.0 | Shelby
Tube | 5 | 28.0-30.0 | 11 | 43 | 50+ | 50+ | | | | Sand: medium grained, uniformly graded, well rounded clean, brown, varved clay at 29.6 ft. (SP/CH)
(Second shelby tube taken 30-32 ft.) |

850130593

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number: _____

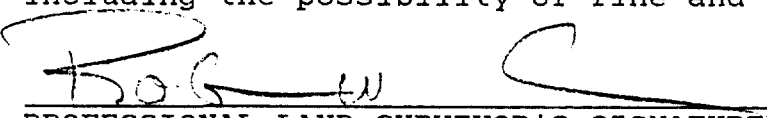
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 7042 - 12S
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-02.53"
Latitude (one tenth of a second): North 40°44'-30.39"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.46'PVC, 11.07'CASING, 9.33'GRND
Owners Well Number (As shown on application
or plans): MW-12S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130594

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 3 8 1

Owner's Well Number (As shown on the application or plans):

MW-13S

Well Completion Date:

5-4-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.61

Total Depth of Well (one-tenth of a foot):

10.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

4.61

Screen Length (feet):

7.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

5.00

Yield (Gallons per Minute):

0.5 GPM

Length of time Well Pumped or Bailed:

Hours 45 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LOPER

Professional Name
(Please type or print)

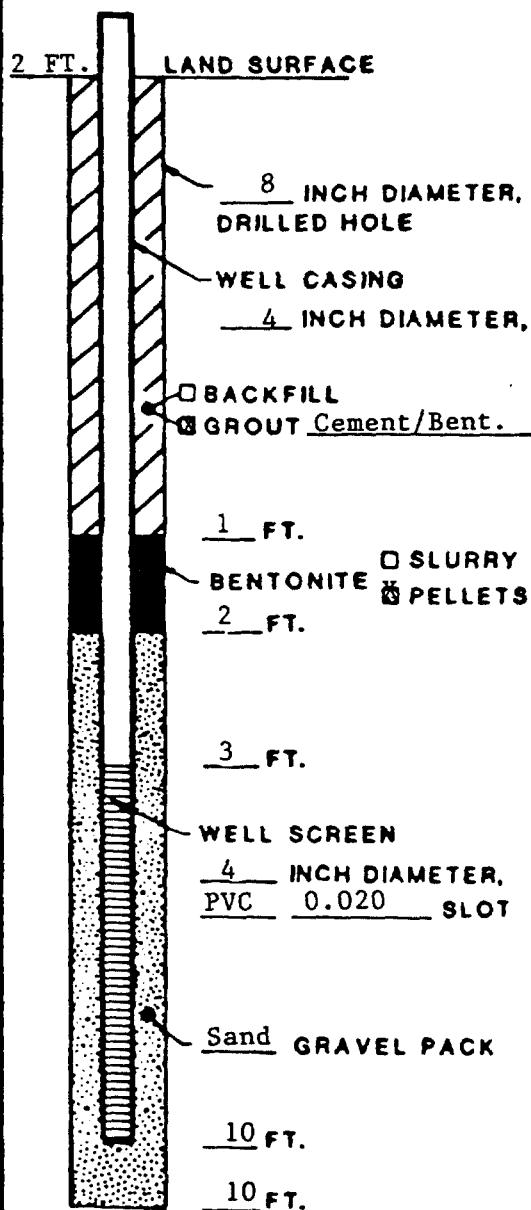
ENGINEER

GE 34148

Professional License #

SEAL

MONITORING WELL CONSTRUCTION LOG



NOTE:
 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-13S PERMIT NO. 26-201381

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.41 FEET ☒ SURVEYED

☐ ESTIMATED

INSTALLATION DATE(S) 4/30/90

DRILLING METHOD Hollow Stem Auger

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 22.5 GALLONS

STATIC DEPTH TO WATER 5.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.75 HOURS

YIELD 0.5 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS _____

HYDROGEOLOGIST J. Powley

850130596

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 13S
Study No. _____ Date 04/30/90
Project 06606J
Client Monsanto
Page 1 of 1
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 16:07 Ended 16:55
Driller Empire Soils Investigations
Type of Rig Hollow Stem Auger

WELL DATA
Hole Diam. (in.) 8
Final Depth (ft.) 10 BGS
Casing Diam. (in.) 4
Casing Interval (ft.) 0 - 3
Screen Interval (ft.) 3 - 10
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)
Date _____ DTW MP(2) _____ Elev.W.T. _____

SAMPLER
Type Split Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | | | 0-1' | | | | Black fill material |
| 0.0 ppm | 1 | 1.1' | 1-3' | 79-43-34-25 | Fill Material | 1 | |
| | | | | | | | 1.5': Brown to dark gray silty fine to medium sand with some gravel. |
| NA | 2 | 0 | 3-5' | 12-13-11-7 | Silty Sand | 3 | No recovery, spoon was wet. |
| 0.0 ppm | 3 | 1.3' | 5-7' | 4-6-6-5 | | 5 | Black silty medium to coarse sand with gravel, wet. |
| 0.0 ppm | 4 | 1.0' | 7-9' | 2-1-1-2 | Peat and Clay | 7 | 6': Peat with clay, wet. |
| | | | | | | 9 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130597

MO06606J.2.14 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

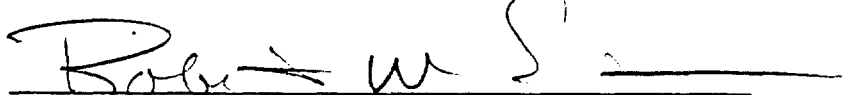
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20138 - 1
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07' -09.19"
Latitude (one tenth of a second): North 40°-44' -30.06"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.02'PVC, 11.10'CASING, 8.41'GRND
Owners Well Number (As shown on application
or plans): MW-13S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130598

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 13S

Study No. _____ Date 04/30/90

Project 06606J

Client Monsanto

Page 1 of 1

Logged By J. Powley

Loc. _____

M.P. Elevation _____

Drilling Started 16:07 Ended 16:55

Driller Empire Soils Investigations

Type of Rig Hollow Stem Auger

WELL DATA

Hole Diam. (in.) 8

Final Depth (ft.) 10 BGS

Casing Diam. (in.) 4

Casing Interval (ft.) 0 - 3

Screen Interval (ft.) 3 - 10

Screen Slot & Type .020 PVC

Well Status _____

G W READINGS(1)

Date _____ DTW MP(2) _____ Elev.W.T. _____

SAMPLER

Type Split Spoon

Hammer 140 lb.

Fall 30 in.

DEVELOPMENT

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|----------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | | | 0-1' | | | | Black fill material |
| 0.0 ppm | 1 | 1.1' | 1-3' | 79-43-34-25 | Fill Material | 1 | |
| | | | | | | | 1.5': Brown to dark gray silty fine to medium sand with some gravel. |
| NA | 2 | 0 | 3-5' | 12-13-11-7 | Silty Sand | 3 | No recovery, spoon was wet. |
| 0.0 ppm | 3 | 1.3' | 5-7' | 4-6-6-5 | | 5 | Black silty medium to coarse sand with gravel, wet. |
| 0.0 ppm | 4 | 1.0' | 7-9' | 2-1-1-2 | Peat and Clay | 7 | 6': Peat with clay, wet. |
| | | | | | | 9 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130599

MO06606J.2.14 6.90

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 2 0 1 4 1 1

Owner's Well Number (As shown on the application or plans):

MW-14S

Well Completion Date:

4-30-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.45

Total Depth of Well (one-tenth of a foot):

10.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

5.45

Screen Length (feet):

7.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

5.00

Yield (Gallons per Minute):

3 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional

Signature

JOHN L. LOPEN

Professional

Name

(Please type or print)

ENGINEER

GE 34148

Professional

License #

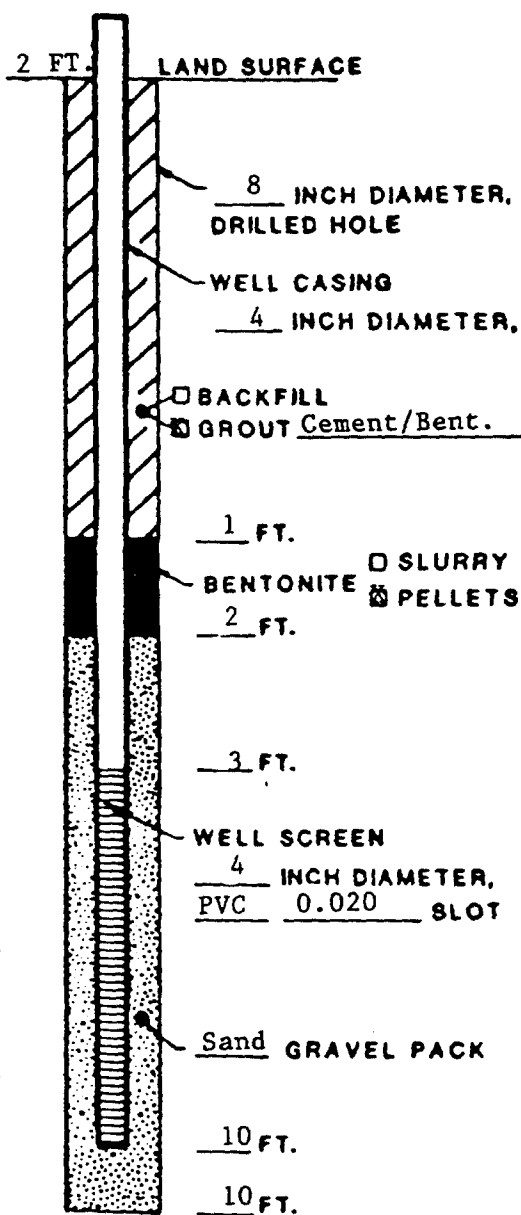
SEAL

850130600



Consulting Ground-Water Geologists
ROUX ASSOCIATES INC

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-14S PERMIT NO. 26-201411

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.26 FEET ☒ SURVEYED

☐ ESTIMATED

INSTALLATION DATE(S) 4/30/90

DRILLING METHOD Hollow Stem Auger

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 63 GALLONS

STATIC DEPTH TO WATER 5.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.33 HOURS

YIELD 3 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS _____

HYDROGEOLOGIST J. Powley

850130601

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>14S</u>

Study No. _____ Date <u>04/30/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>12:05</u> Ended <u>14:45</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Hollow Stem Auger</u> | <p style="text-align: center;">WELL DATA</p> Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>10 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0-3</u>
Screen Interval (ft.) <u>3-10</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | <p style="text-align: center;">G W READINGS(1)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td style="height: 40px;"></td> <td></td> <td></td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| <p style="text-align: center;">SAMPLER</p> Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | <p style="text-align: center;">DEVELOPMENT</p> | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------------|-------------------------------|---------------|-------------------------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | | | 0-1 | | Fill Material | 1 | Black Fill Material |
| 0.0 ppm | 1 | 1.5 | 1-3 | 7-8-8-12 | | 3 | 2.5: Reddish brown silty medium to coarse sand.
4: Grayish brown silty medium to coarse sand, wet. |
| 0.0 ppm | 2 | 1.8 | 3-5 | 8-9-12-11 | Silty Sand | 5 | Grayish brown silty medium to coarse sand with some gravel, wet. |
| 0.0 ppm | 3 | 1.3 | 5-7 | 2-2-3-5 | | 7 | |
| 0.0 ppm | 4 | 0.8 | 7-9 | 7-7-9-12 | Peat and Clay | 9 | Grayish brown clay with peat and black organic material, wet. |
| 0.0 ppm | 5 | 2.0 | 9-11 | Weight of hammer | | 11 | |
| 0.0 ppm | 6 | 2.0 | 11-13 | 11-4-4-3 | | 13 | |
| 0.0 ppm | 7 | 2.0 | 13-15 | 4-3-3-2 | | 15 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130602

MO06606J.2.13 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

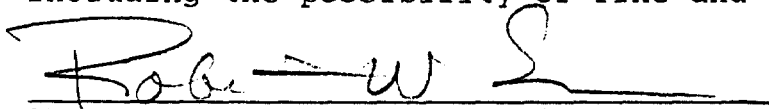
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20141 - 1
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-04.78"
Latitude (one tenth of a second): North 40°44'-28.30"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.71'PVC, 11.02'CASING, 8.26'GRND
Owners Well Number (As shown on application
or plans): MW-14S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130603

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 3 9 9

Owner's Well Number (As shown on the application or plans):

MW-15S

Well Completion Date:

5-1-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

-0.30

Total Depth of Well (one-tenth of a foot):

15.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

4.70

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

2.00

Yield (Gallons per Minute):

1.75 GPM

Length of time Well Pumped or Bailed:

Hours 35 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LARSEN

Professional Name
(Please type or print)

ENGINEER

CE 34148

Professional License #

SEAL

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 7 0 3 4 3 D

Owner's Well Number (As shown on the application or plans):

MW-3D

Well Completion Date:

9-26-84

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

0.75

Total Depth of Well (one-tenth of a foot):

29.30 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

20.05

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

9.07

Yield (Gallons per Minute):

2 GPM

Length of time Well Pumped or Bailed:

Hours 30 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LODER

Professional Name
(Please type or print)

SEAL

ENGINEER GE 34148
Professional License #

850130605

OBSERVATION WELL CONSTRUCTION SUMMARY

PROJECT Monsanto - 2101
 SITE Kearny, New Jersey

O.H. MATERIALS CO.

WELL NO. 3D

COORDINATES _____

O H M

AQUIFER _____

DATE COMPLETED 9/26/84

THE ENVIRONMENTAL
 SERVICES COMPANY

SUPERVISED BY M. Glaze, R. Beckwith

DRAWING NO. 2101 A-748-P

DATE

BY

REVISIONS

CHECKED BY/DATE

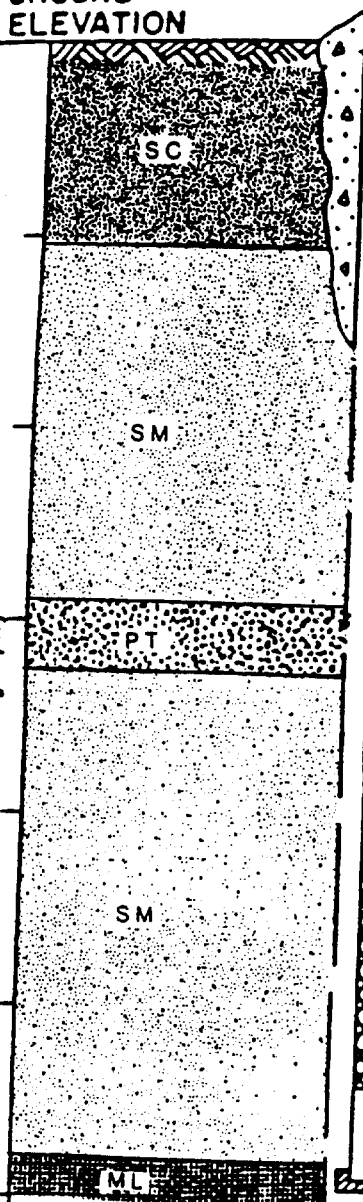
APPROVED BY/DATE

DRAWN BY

DATE 1/17/85

Generalized Stratigraphy

GROUND
 ELEVATION



Elevation of reference point _____

Height of reference point above
 ground surface _____

Depth of surface seal _____

2 feet

Type of surface seal: Portland cement

I. D. of surface casing _____

N/A

Type of surface casing: N/A

Depth of surface casing _____

N/A

I. D. of riser pipe _____

4 inch

Type of riser pipe: Schedule 40 PVC

Diameter of borehole _____

12 inch

Type of filler: Natural Soil

Elevation / depth of top of seal _____

13 feet

Type of seal: Bentonite

Type of gravel pack Silica sand

Elev./depth of top of gravel pack _____

15 feet

Elevation / depth of top of screen _____

20 feet

Description of screen .020 slot
 schedule 40 PVC

I. D. of screen section _____

4 inches

Elevation / depth of bottom of screen _____

30 feet

Elev. / depth of bottom of gravel pack _____

30 feet

Elev. / depth of bottom of plugged
 blank section _____

Type of filler below plugged
 section N/A

Elevation of bottom of borehole _____

850130606

DRILLER: OHM

BORING LOG

PROJECT NAME Monsanto/Kearny, NJPROJECT NO. 210BORING NO. 3dLOGGED BY MGDATE 9-26-84SURFACE ELEV. 100.0PAGE 2 OF 2

| DRILLING | | SAMPLE | | | | | | | GEOLOGIC LOG | | |
|---------------|----------------|----------------------|-----------|---------------------------|---------------|-------|-------|-----------------|---------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEPTH
(FT) | LOG | TYPE | NUMBER | DEPTH
INTERVAL
(FT) | BLOW
COUNT | | | RECOVERY
(%) | USCS
CLASS | CONTACT
DEPTH | DESCRIPTIONS & COMMENTS |
| | | | | | 0-10 | 10-20 | 20-30 | | | | |
| 16.0 | | SPLIT SPOON SAMPLING | | | | | | | | | |
| 18.0 | | | | | | | | | | | |
| 20.0 | | | | | | | | | | | |
| 22.0 | | 4 | 21.0-23.0 | 23 | 50+ | 50+ | 50+ | | | | Silty sand: fine to medium grained approximately 10 percent coarse sand, color changing from gray to reddish brown to 22.5 feet, some angular coarse gravel intermixed (S) |
| 24.0 | | | | | | | | | | | |
| 26.0 | | | | | | | | | | | |
| 28.0 | | | | | | | | | | | |
| 30.0 | SHELBY
TUBE | 5 | 28.0-30.0 | | | | | | | | Silt: low plasticity, some stringers of fine sand, dark brownish gray (ML) |

B.O.H.

850130608

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number: _____


LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 7034 - 3D
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-00.64"
Latitude (one tenth of a second): North 40°-44'-30.45"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 9.83'PVC, 11.02'CASING, 9.08'GRND
Owners Well Number (As shown on application
or plans): MW-3D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130609

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 2 9

Owner's Well Number (As shown on the application or plans):

MW-6D

Well Completion Date:

5/4/90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.04

Total Depth of Well (one-tenth of a foot):

27.50 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

19.54

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

9.00

Yield (Gallons per Minute):

8 GPM

Length of time Well Pumped or Bailed:

Hours 15 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LOPER

Professional Name
(Please type or print)

ENGINEER

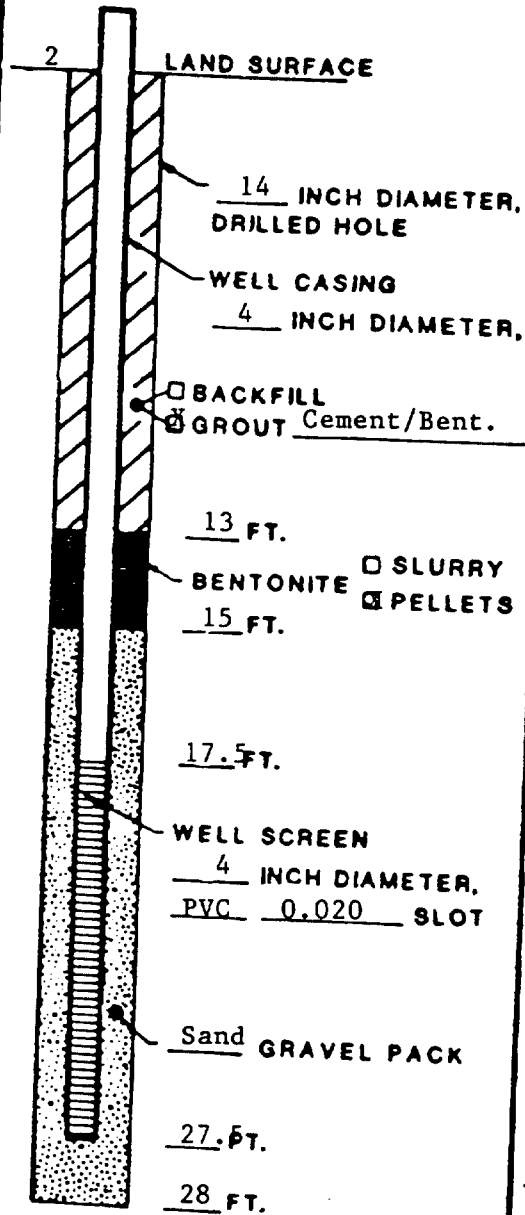
GE 34148

Professional License #

SEAL

850130610

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J
WELL NO. MW-6D PERMIT NO. 26-20142-9
TOWN/CITY Kearny
COUNTY Hudson STATE NJ
LAND-SURFACE ELEVATION
AND DATUM 8.53 FEET ☐ SURVEYED
☐ ESTIMATED
INSTALLATION DATE(S) 5/4/90
DRILLING METHOD Mud Rotary
DRILLING CONTRACTOR Empire Soils Investgation
DRILLING FLUID Water
DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible pump 5/18/90
FLUID LOSS DURING DRILLING _____ GALLONS
WATER REMOVED DURING DEVELOPMENT 120 GALLONS
STATIC DEPTH TO WATER 9 FEET BELOW M.P.
PUMPING DEPTH TO WATER _____ FEET BELOW M.P.
PUMPING DURATION 0.25 HOURS
YIELD 8 GPM 5/18/90 DATE _____
SPECIFIC CAPACITY _____ GPM/FT.
WELL PURPOSE Monitoring well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 13.25'.

HYDROGEOLOGIST J. Powley

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>6D</u>
Study No. _____ Date <u>5/4/90 & 5/5/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/4/90</u> Ended <u>5/5/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and mud rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27.5 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17.5</u>
Screen Interval (ft.) <u>17.5 - 27.5</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change & Gen. Desc. | Depth (ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------------------|----------------------------|------------|----------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 4-4-4-9 | Fill Material | 0 | Black gravelly fill material. |
| NA | 2 | 0 | 2-4 | 9-4-3-3 | | 2 | No recovery. |
| 5.0 | 3 | 1.7 | 4-6 | 6-7-5-7 | | 4 | Gray to red-brown medium sand with silt, slight organic odor present, wet. |
| 16.0 | 4 | 1.7 | 6-8 | 1-1-2-2 | Sand | 6 | Red-brown medium sand with silt, slight organic odor present, wet. |
| 3.0 | 5 | 1.7 | 8-10 | 4-3-4-4 | | 8 | |
| 0.0 | 6 | 2.0 | 10-12 | 2-1-1-1 | | 10 | Dark gray medium to coarse sand with silt, wet. |
| 0.0 | 7 | 2.0 | 12-14 | Weight of hammer -1-1 | Peat | 12 | 11.8: Peat |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130612

MO06606J.1.43 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 6D
Study No. _____ Date 5/4/90 & 5/5/90
Project 06606J
Client Monsanto
Page 2 of 2
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 5/4/90 Ended 5/5/90
Driller Empire Soils Investigations
Type of Rig Auger and mud rotary

WELL DATA
Hole Diam. (in.) 14
Final Depth (ft.) 27.5 BGS
Casing Diam. (in.) 8 and 4
Casing Interval (ft.) 0 - 17.5
Screen Interval (ft.) 17.5 - 27.5
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)
Date _____ DTW MP(2) _____ Elev.W.T. _____

SAMPLER
Type Split spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|-------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 8 | 0.5 | 14-16 | 1-1-3-4 | Peat | 14 | |
| 0.0 | 9 | 2.0 | 16-18 | 9-15-18-14 | | 16 | Red-brown medium sand with silt and some gravel, wet. |
| 0.0 | 10 | 1.3 | 18-20 | 10-10-9-8 | | 18 | |
| 0.0 | 11 | 1.2 | 20-22 | 7-9-9-11 | Sand | 20 | Red-brown medium sand with silt and some gravel, wet. |
| 0.0 | 12 | 1.7 | 22-24 | 6-5-9-8 | | 22 | |
| 0.0 | 13 | 2.0 | 24-26 | 14-19-19-22 | | 24 | -25: Fine gray sand with silt, wet. |
| 0.0 | 14 | 2.0 | 26-28 | 17-12-12-13 | Silt | 26 | Gray silt, wet. |
| | | | | | | 28 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130613

MO06606J.1.43 7.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDDES Number: _____

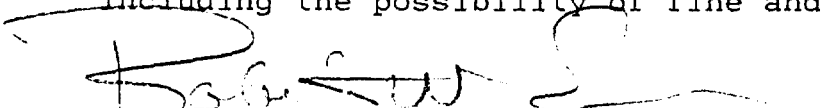
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20142 - 9
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-09.55"
Latitude (one tenth of a second): North 40°-44'-33.11"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.46'PVC, 11.67'CASING, 9.42'GRND
Owners Well Number (As shown on application
or plans): MW-6D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent

PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801

PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDDES permit.

850130614

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 3 7

Owner's Well Number (As shown on the application or plans):

MW-7D

Well Completion Date:

5/4/90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.27

Total Depth of Well (one-tenth of a foot):

27.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

19.27

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

8.35

Yield (Gallons per Minute):

4 GPM

Length of time Well Pumped or Bailed:

Hours 20 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

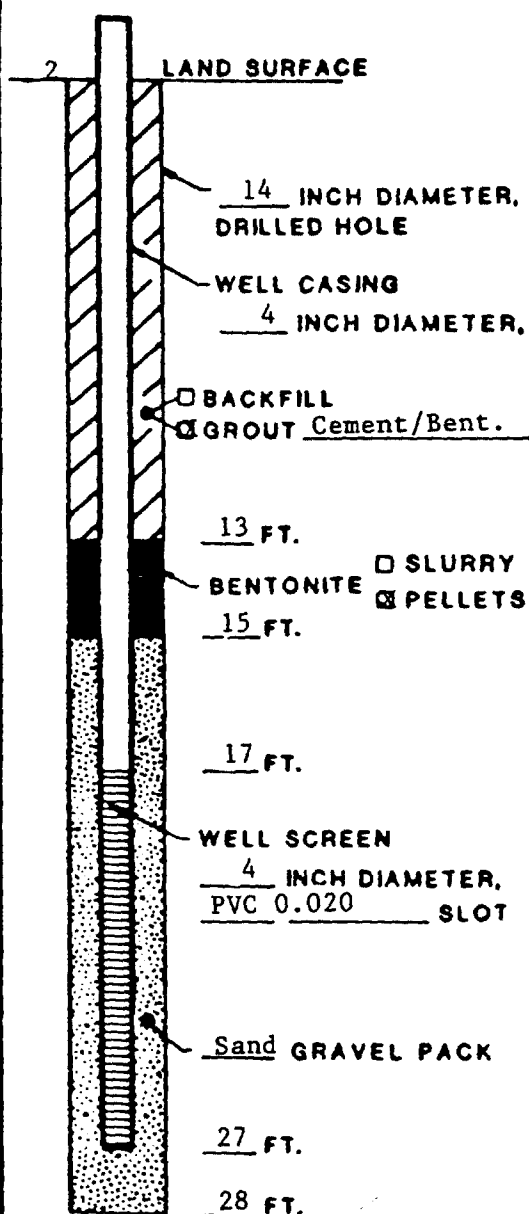
JOHN R. LOPEZ

Professional Name
(Please type or print)

SEAL

ENGINEER GE 34148
Professional License #

850130615

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACEPROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-7D PERMIT NO. 26-20143-7TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.53 FEET☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/4/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 84 GALLONSSTATIC DEPTH TO WATER 8.35 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.33 HOURSYIELD 4 GPM 5/17/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring WellsREMARKS Double-cased well: 8 inch diameter outer steel casing to 13.5'.HYDROGEOLOGIST J. Powley

850130616

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>7D</u>
Study No. _____ Date <u>5/4/90 and 5/5/90</u>
Project <u>00606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/4/90</u> Ended <u>5/5/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17</u>
Screen Interval (ft.) <u>17 - 27</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|----------------------|-------------------------------|----------------|------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.25 | 0-2 | 5-3-2-1 | Fill Material | 0 | Black gravelly fill, wet. |
| 10.0 ppm | 2 | 0.3 | 2-4 | 1-1-2-2 | | 2 | Organic odor present. |
| 70.0 ppm | 3 | 0.6 | 4-6 | 1-3-4-4 | | 4 | Organic odor present. |
| 3.0 ppm | 4 | 2.0 | 6-8 | 4-4-4-5 | Medium Sand | 5 | Red-brown medium sand, organic odor present, wet. |
| 29.0 ppm | 5 | 1.8 | 8-10 | 5-6-4-4 | | 6 | Gray-brown silty medium sand, wet. |
| 29.0 ppm | 6 | 1.0 | 10-12 | 1-3-2-3 | | 8 | Red-brown medium sand, wet. |
| 0.0 ppm | 7 | 2.0 | 12-14 | 3-Weight of Hammer-1 | Peat | 10 | 11.5- Peat, wet. OVM = 8.0 ppm. |
| 0.0 ppm | 8 | 2.0 | 14-16 | 2-3-3-5 | | 12 | |
| 0.0 ppm | 9 | 2.0 | 16-18 | 5-6-10-10 | | 14 | |
| 0.0 ppm | 10 | 1.7 | 18-20 | 15-14-13-16 | Sand | 16 | 17- Gray silty fine to medium sand, wet. |
| 0.0 ppm | 11 | 1.2 | 20-22 | 5-6-6-5 | | 18 | 19.5- Red-brown medium to coarse sand with silt and gravel, wet. |
| 0.0 ppm | 12 | 1.5 | 22-24 | 5-8-8-8 | | 20 | |
| 0.0 ppm | 13 | 1.7 | 24-26 | 8-7-9-6 | Silt and Clay | 22 | |
| | | | | | | 24 | 25.5- Gray silt and varved clay, wet. |
| | | | | | | 26 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130617

MO06606J.4.1 8.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJDES Number: _____


LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20143 - 7
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-06.59"
Latitude (one tenth of a second): North 40°44'-30.63"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.80'PVC, 11.07'CASING, 8.53'GRND
Owners Well Number (As shown on application
or plans): MW-7D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJDES permit.

850130618

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 4 5

Owner's Well Number (As shown on the application or plans):

MW-8D

Well Completion Date:

5/2/90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.16

Total Depth of Well (one-tenth of a foot):

27.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

19.16

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

8.30

Yield (Gallons per Minute):

8 GPM

Length of time Well Pumped or Bailed:

Hours 12 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

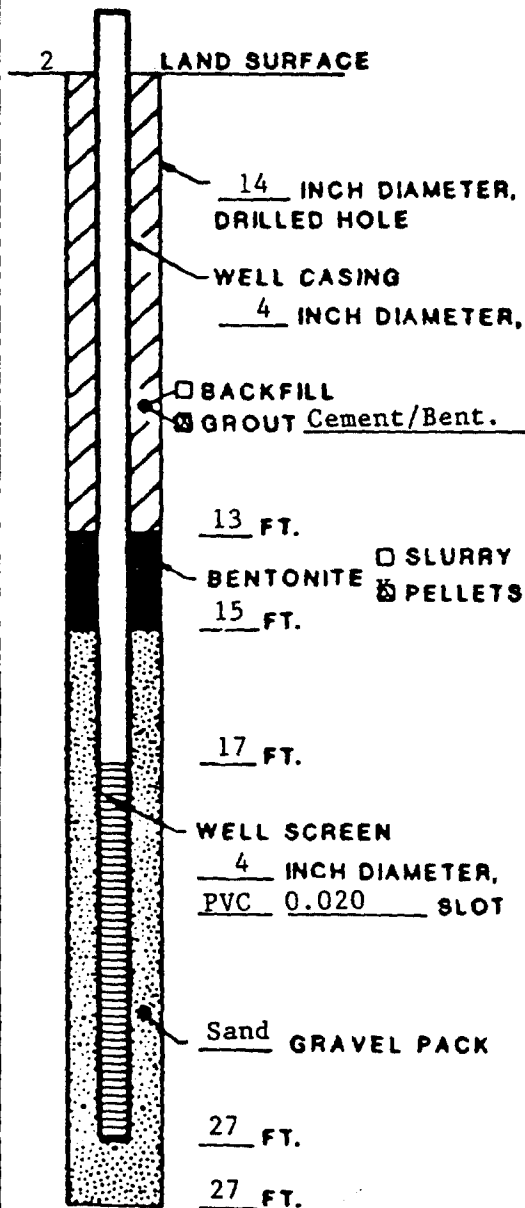
JOHN L. LOPER

Professional Name
(Please type or print)

SEAL

ENGINEER CE 34148
Professional License #

850130619

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsant Kearny Plant NUMBER 06606J

WELL NO. MW-8D PERMIT NO. 26-20144-5

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION AND DATUM 7.58 FEET ☐ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 5/2/90

DRILLING METHOD Empire Soils Investigations

DRILLING CONTRACTOR water

DRILLING FLUID _____

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 96 GALLONS

STATIC DEPTH TO WATER 8.3 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.19 HOURS

YIELD 8 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 9.5'.

HYDROGEOLOGIST J. Powley

850130620

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 8D
Date 5/2/90 and 5/3/90
Study No. _____ Date 5/3/90
Project 06606J
Client Monsanto
Page 1 of 1
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 5/2/90 Ended 5/3/90
Driller Empire Soils Investigations
Type of Rig Mud Rotary

WELL DATA
Hole Diam. (in.) 14
Final Depth (ft.) 27 BGS
Casing Diam. (in.) 8 and 4
Casing Interval (ft.) 0 - 17
Screen Interval (ft.) 17 - 27
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)

| Date | DTW MP(2) | Elev.W.T. |
|------|-----------|-----------|
| | | |
| | | |
| | | |

SAMPLER
Type Split Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft.) | SAMPLE DESCRIPTION |
|-----------|--------|-----------|------------|------------|-------------------------------|----------------|--------------------------------------------------------------------------|
| | No. | Rec.(in.) | Depth(ft.) | Blow/6" | | | |
| 0.2 ppm | 1 | 1.0 | 0-2 | 11-20-11-7 | Fill Material and Sand | 2 | Black to gray fill material with gravel. |
| 0.2 ppm | 2 | 0.9 | 2-4 | 5-4-3-4 | | 4 | Gray clayey fill material with gravel, concrete, and brick debris, wet. |
| 0.2 ppm | 3 | 1.6 | 4-6 | 4-4-3-2 | | 6 | Grayish brown fill material with gravel, concrete and brick debris, wet. |
| 0.2 ppm | 4 | 1.7 | 6-8 | 2-1-1-2 | | 8 | 7.3 - Peat, wet. |
| 0.0 ppm | 5 | 1.3 | 8-10 | 1-1-1-2 | Peat | 10 | |
| 0.0 ppm | 6 | 1.5 | 10-12 | 1-2-2-1 | | 12 | No recovery. |
| 0.0 ppm | 7 | 0 | 12-14 | 2-3-2-2 | | 14 | |
| 0.0 ppm | 8 | 1.7 | 14-16 | 0-2-3-6 | | 16 | 14.5 - brown fine sand with silt, wet. |
| 0.0 ppm | 9 | 1.7 | 16-18 | 7-6-5-6 | | 18 | |
| 2.0 ppm | 10 | 1.5 | 18-20 | 5-3-5-6 | Sand and Silt | 20 | Grayish brown fine sand with silt, very faint organic odor, wet. |
| 0.0 ppm | 11 | 1.0 | 20-22 | 4-3-4-8 | | 22 | Grayish brown medium to coarse sand with silt, wet. |
| 0.0 ppm | 12 | 2.0 | 22-24 | 3-6-7-11 | | 24 | |
| 0.0 ppm | 13 | 2.0 | 24-26 | 5-5-10-11 | | 26 | 25.8 - Gray fine sand. |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130621

MO06606J.3.58 8.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number: _____

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20144 - 5
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-03.48"
Latitude (one tenth of a second): North 40°-44'-26.64"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 9.74'PVC, 10.16'CASING, 7.58'GRND
Owners Well Number (As shown on application
or plans): MW-8D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130622

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 2 0 1 4 5 3

Owner's Well Number (As shown on the application or plans):

Well Completion Date:

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

Total Depth of Well (one-tenth of a foot):

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

Screen Length (feet):

Screen or Slot Size:

Screen Material:

Casing Material: (PVC, Steel or Other-Specify):

Casing Diameter: (Inches):

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

Yield (Gallons per Minute):

Length of time Well Pumped or Bailed:

Lithologic Log:

MW-9D
5/16/90
-0.17
30.00 (from land surface)
19.83
10.0
.020
PVC
PVC
4.00
6.30
4 GPM
Hours 30 Minutes
ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

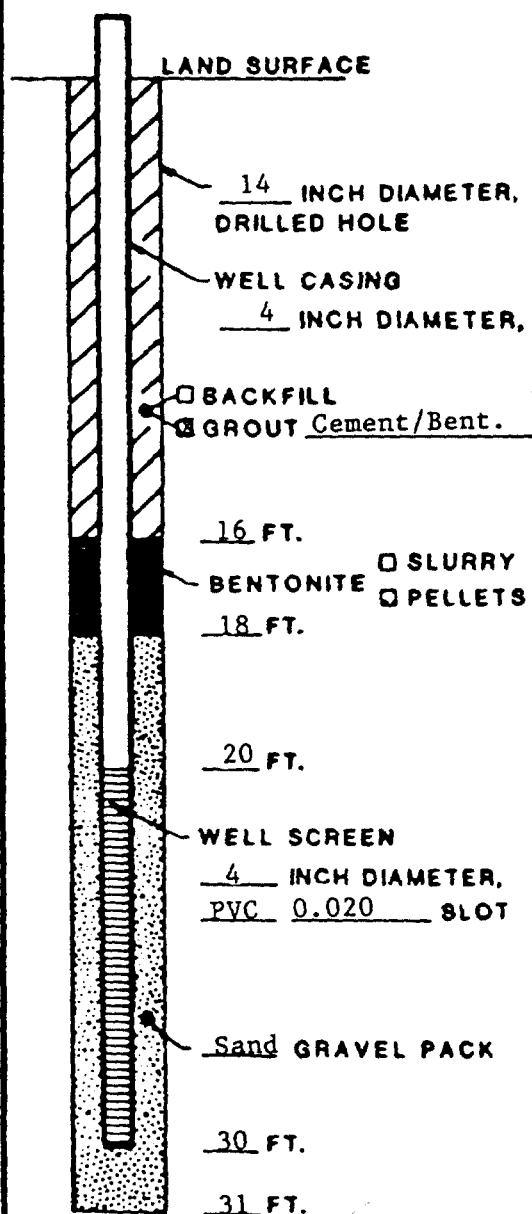
John R. Lopez
Professional Signature

JOHN R. LOPEZ
Professional Name
(Please type or print)

ENGINEER
Professional License # GE 34148

SEAL

850130623

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-9D PERMIT NO. 26-20145-3

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
AND DATUM 9.31 FEET ☒ SURVEYED
☐ ESTIMATED

INSTALLATION DATE(S) 5/16/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump 5/22/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 112 GALLONS

STATIC DEPTH TO WATER 6.3 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.5 HOURS

YIELD 4 GPM 5/22/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well - Flush Mount

REMARKS Double-cased well: 8 inch diameter outer
steel casing to 14.6'.

HYDROGEOLOGIST J. Powley

850130624

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>9D</u>

Study No. _____ Date <u>5-15-90 & 5/16/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/15/90</u> Ended <u>5/16/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and mud rotary</u> | WELL DATA
Hole Diam. (in.) <u>10</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20-30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Spilt Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|----------|-------------------------------|---------------|-------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 242 ppm | 1 | 1.1 | 0-2 | 5-7-10-7 | Fill Material | 0 | Asphalt. Brown sandy fill material.
1: Black oily, gravelly fill material. |
| 222 ppm | 2 | 0.6 | 2-4 | 2-2-2-2 | | 2 | Black oily fill material. |
| 56 ppm | 3 | 0.25 | 4-6 | 3-2-3-2 | | 4 | Black oily fill material, wet. Poor recovery |
| 147 ppm | 4 | 1.3 | 6-8 | 2-2-2-4 | Sand | 6 | 7: Red-brown medium sand, wet. |
| 42 ppm | 5 | 2.0 | 8-10 | 4-5-7-2 | | 8 | |
| 33 ppm | 6 | 0.9 | 10-12 | 3-2-2-3 | | 10 | |
| 13 ppm | 7 | 2.0 | 12-14 | 2-3-2-3 | Peat | 12 | Gray-brown medium sand, wet.
13: Peat. |
| | | | | | | 14 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130625

MO06606J.1.38 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 9D

Study No. _____ Date 5-15-90 & 5/16/90

Project 06606J

Client Monsanto

Page 1 of 1

Logged By J. Powley

Loc. _____

M.P. Elevation _____

Drilling Started 5/15/90 Ended 5/16/90

Driller Empire Soils Investigations

Type of Rig Auger and mud rotary

WELL DATA

Hole Diam. (in.) 10

Final Depth (ft.) 30 BGS

Casing Diam. (in.) 8 and 4

Casing Interval (ft.) 0 - 20

Screen Interval (ft.) 20-30

Screen Slot & Type .020 PVC

Well Status _____

G W READINGS(1)

| Date | DTW MP(2) | Elev.W.T. |
|------|-----------|-----------|
| | | |
| | | |
| | | |

SAMPLER

Type Spilt Spoon

Hammer 140 lb.

Fall 30 in.

DEVELOPMENT

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|----------|-------------------------------|---------------|-------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 242 ppm | 1 | 1.1 | 0-2 | 5-7-10-7 | Fill Material | 0 | Asphalt. Brown sandy fill material.
1: Black oily, gravelly fill material. |
| 222 ppm | 2 | 0.6 | 2-4 | 2-2-2-2 | | 2 | Black oily fill material. |
| 56 ppm | 3 | 0.25 | 4-6 | 3-2-3-2 | | 4 | Black oily fill material, wet. Poor recovery |
| 147 ppm | 4 | 1.3 | 6-8 | 2-2-2-4 | Sand | 6 | 7: Red-brown medium sand, wet. |
| 42 ppm | 5 | 2.0 | 8-10 | 4-5-7-2 | | 8 | |
| 33 ppm | 6 | 0.9 | 10-12 | 3-2-2-3 | | 10 | |
| 13 ppm | 7 | 2.0 | 12-14 | 2-3-2-3 | Peat | 12 | Gray-brown medium sand, wet.
13: Peat. |
| | | | | | | 14 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130626

MO06606J.1.38 7.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-1-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20145 - 3
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-02.09"
Latitude (one tenth of a second): North 40°-44'-32.23"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 9.14'PVC, 9.45'CASING, 9.31'GRND
Owners Well Number (As shown on application
or plans): MW-9D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130627

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 6 1

Owner's Well Number (As shown on the application or plans):

MW-10D

Well Completion Date:

5-7-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.94

Total Depth of Well (one-tenth of a foot):

29.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

20.94

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

9.30

Yield (Gallons per Minute):

5.5 GPM

Length of time Well Pumped or Bailed:

Hours 30 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LONGA

Professional Name
(Please type or print)

ENGINEER

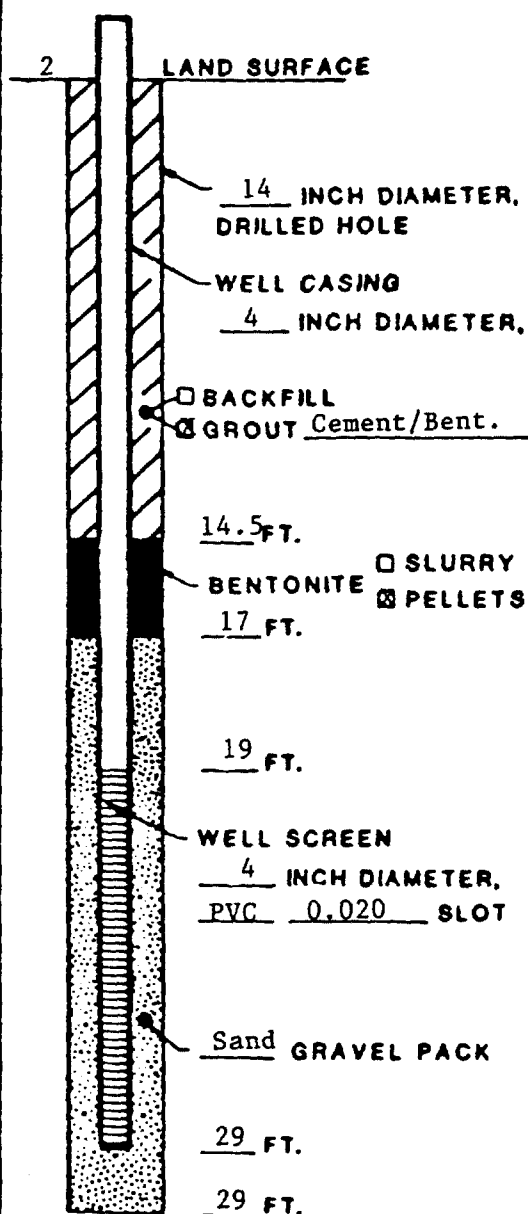
GE 34148

Professional License #

SEAL

850130628

MONITORING WELL CONSTRUCTION LOG



NOTE:
 ALL DEPTHS IN FEET
 BELOW LAND SURFACE

| | | | |
|--------------------------------------|-----------------------------------------------------------------|----------------------------------------------|------------|
| PROJECT NAME | Monsanto Kearny Plant | NUMBER | 06606J |
| WELL NO. | MW-10D | PERMIT NO. | 26-20146-1 |
| TOWN/CITY | Kearny | | |
| COUNTY | Hudson | STATE | NJ |
| LAND-SURFACE ELEVATION | 9.64 | FEET | |
| AND DATUM | | | |
| | | <input checked="" type="checkbox"/> SURVEYED | |
| | | <input type="checkbox"/> ESTIMATED | |
| INSTALLATION DATE(S) | 5/7/90 | | |
| DRILLING METHOD | Mud Rotary | | |
| DRILLING CONTRACTOR | Empire Soils Investigations | | |
| DRILLING FLUID | water | | |
| DEVELOPMENT TECHNIQUE(S) AND DATE(S) | Submersible Pump | 5/21/90 | |
| FLUID LOSS DURING DRILLING | | GALLONS | |
| WATER REMOVED DURING DEVELOPMENT | 170 | GALLONS | |
| STATIC DEPTH TO WATER | 9.3 | FEET BELOW M.P. | |
| PUMPING DEPTH TO WATER | | FEET BELOW M.P. | |
| PUMPING DURATION | 0.5 | HOURS | |
| YIELD | 5.5 | GPM | 5/21/90 |
| SPECIFIC CAPACITY | | GPM/FT. | |
| WELL PURPOSE | Monitoring Well | | |
| REMARKS | Double-cased well: 8 inch diameter outer steel casing to 13.5'. | | |
| HYDROGEOLOGIST | J. Powley | | |

850130629

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>10D</u>
Study No. _____ Date <u>5/5/90 & 5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/5/90</u> Ended <u>5/7/90</u>
Driller <u>Epire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------|-------------------------------|---------------|------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 1-1-1-1 | Fill Material | 0 | Black to brown fill with gravel. |
| 0.0 | 2 | 0. | 2-4 | 2-1-2-2 | | 2 | Black to brown fill with gravel,wet. |
| 0.0 | 3 | 0.9 | 4-6 | 2-3-4-4 | | 4 | |
| 0.0 | 4 | 1.8 | 6-8 | 2-3-4-4 | | 6 | |
| 0.0 | 5 | 2.0 | 8-10 | 4-4-5-8 | Sand | 8 | |
| 0.0 | 6 | 2.0 | 12-12 | W/H-1-1-2 | Peat | 10 | -6.5: Gray to red-brown medium to coarse sand, wet.

-11.5: Peat |
| 1.8 | 7 | 1.3 | 12-14 | 1-2-1-4 | | 12 | * |
| 1.8 | 8 | 1.3 | 14-16 | 6-9-10-15 | | 14 | |

REMARKS:

- (1) in feet relative to a common datum
 (2) from top of PVC casing

*NOTE: OVM background measurement on 5/7/90 was 1.8 ppm.
 W/H - Weight of Hammer.

850130630

MO06606J.2.46 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>10D</u>
Study No. _____ Date <u>5/5/90 & 5/7/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/5/90</u> Ended <u>5/7/90</u>
Driller <u>Epire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|-----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 1.8 | 9 | 1.5 | 16-18 | 6-9-10-15 | Peat | 16 | -17: brown silty medium sand with some gravel, wet. |
| 1.4 | 10 | 2.0 | 18-20 | 9-13-14-17 | | 18 | |
| 1.4 | 11 | 1.2 | 20-22 | 9-7-7-6 | Sand | 20 | Gray medium sand with some gravel, wet. |
| 1.4 | 12 | 1.5 | 22-24 | 7-10-8-8 | | 22 | |
| 1.4 | 13 | 2.0 | 24-26 | 10-11-9-9 | | 24 | |
| 1.4 | 14 | 2.0 | 26-28 | 7-7-5-6 | | 26 | -27.5: Red-brown fine sand with silt, wet. |
| | | | | | | 28 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130631

MO06606J.2.46 7.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsant Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20146 - 1
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07' - 01.82"
Latitude (one tenth of a second): North 40°-44' - 33.22"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.58'PVC, 12.00'CASING, 9.64'GRND
Owners Well Number (As shown on application
or plans): MW-10D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130632

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 7 0

Owner's Well Number (As shown on the application or plans):

MW-11D

Well Completion Date:

5-11-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

1.92

Total Depth of Well (one-tenth of a foot):

30.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

21.92

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

8.75

Yield (Gallons per Minute):

9 GPM

Length of time Well Pumped or Bailed:

Hours 30 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

John A. Lopez
Professional Signature

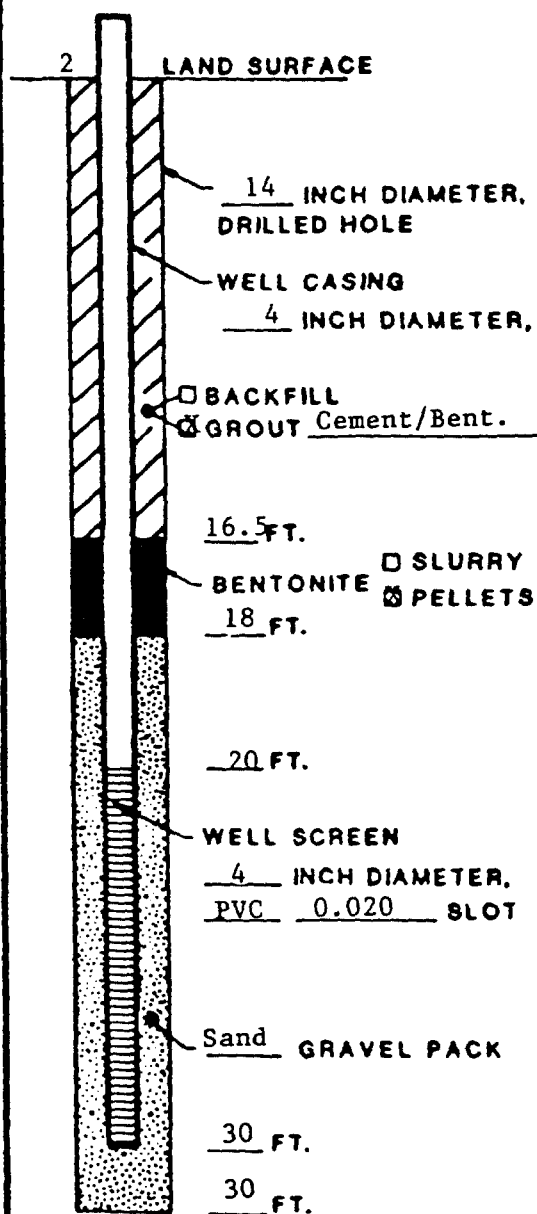
JOHN A. LOPEZ
Professional Name
(Please type or print)

ENGINSER
Professional License #

GE 34148

SEAL

850130633

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACEPROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-11D PERMIT NO. 26-20147-0TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 9.12 FEET ☐ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/11/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 225 GALLONSSTATIC DEPTH TO WATER 8.75 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION _____ HOURS

YIELD 9 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring WellREMARKS Double-cased well: 8 inch diameter outer steel casing to 15.6.HYDROGEOLOGIST J. Powley

850130634

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>11D</u>
Study No. _____ Date <u>5/10/90 & 5/11/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change & Gen. Desc. | Depth (ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|---------|----------------------------|------------|--------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 44.0 | 1 | 0.75 | 0-2 | 4-3-2-2 | Fill Material | 0 | Gray to black oily fill material, strong organic odor. |
| 587.0 | 2 | 0.8 | 2-4 | 5-6-6-5 | | 2 | -3: Red-brown medium sand, wet. Strong organic odor. |
| NA | 3 | 0 | 4-6 | 2-6-7-9 | | 4 | No recovery. |
| 144.0 | 4 | 2.0 | 6-8 | 7-7-7-6 | Sand | 6 | Red-brown medium sand with gravel, wet. Strong organic odor. |
| 170.0 | 5 | 2.0 | 8-10 | 5-4-2-2 | | 8 | Red-brown gravel with sand, wet, strong organic odor. |
| 0.0 | 6 | 1.0 | 10-12 | 3-2-2-2 | | 10 | Gray medium sand, wet, no odor. |
| 0.0 | 7 | 2.0 | 12-14 | 1-1-2-5 | | 12 | -13: Peat. |
| 0.5 | 8 | 2.0 | 15-17 | | | 14 | Note: Background OVM measurement on 5/11/90 was 0.5 ppm. |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130635

MO06606J.2.48 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 11D
5/10/90 &
Study No. _____ Date 5/11/90
Project 06606J
Client Monsanto
Page 2 of 2
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 5/10/90 Ended 5/11/90
Driller Empire Soils Investigations
Type of Rig Auger and Mud Rotary

WELL DATA
Hole Diam. (in.) 14
Final Depth (ft.) 30 BGS
Casing Diam. (in.) 8 and 4
Casing Interval (ft.) 0 - 20
Screen Interval (ft.) 20 - 30
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)
Date _____ DTW MP(2) _____ Elev.W.T. _____

SAMPLER
Type Split Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|------------|-------------------------------|---------------|-------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.5 | 9 | 1.5 | 17-19 | 6-6-10-11 | Peat | 16 | -18.5: Gray-brown coarse sand, wet. |
| 0.7 | 10 | 2.0 | 19-21 | 6-10-13-13 | Sand | 18 | |
| 0.7 | 11 | 2.0 | 21-23 | 9-11-11-10 | | 19 | |
| | | | | | | 21 | Gray medium to coarse sand, wet. |
| | | | | | | 23 | Gray medium sand, wet. |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130636

MO06606J.2.48 7.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20147 - 0
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-04.02"
Latitude (one tenth of a second): North 40°-44'-31.45"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.04'PVC, 11.24'CASING, 9.12'GRND
Owners Well Number (As shown on application
or plans): MW-11D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130637

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 2 0 1 4 8 8

Owner's Well Number (As shown on the application or plans):

MW-12D

Well Completion Date:

5-11-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.12

Total Depth of Well (one-tenth of a foot):

29.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

21.12

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

8.85

Yield (Gallons per Minute):

3.5 GPM

Length of time Well Pumped or Bailed:

Hours 45 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

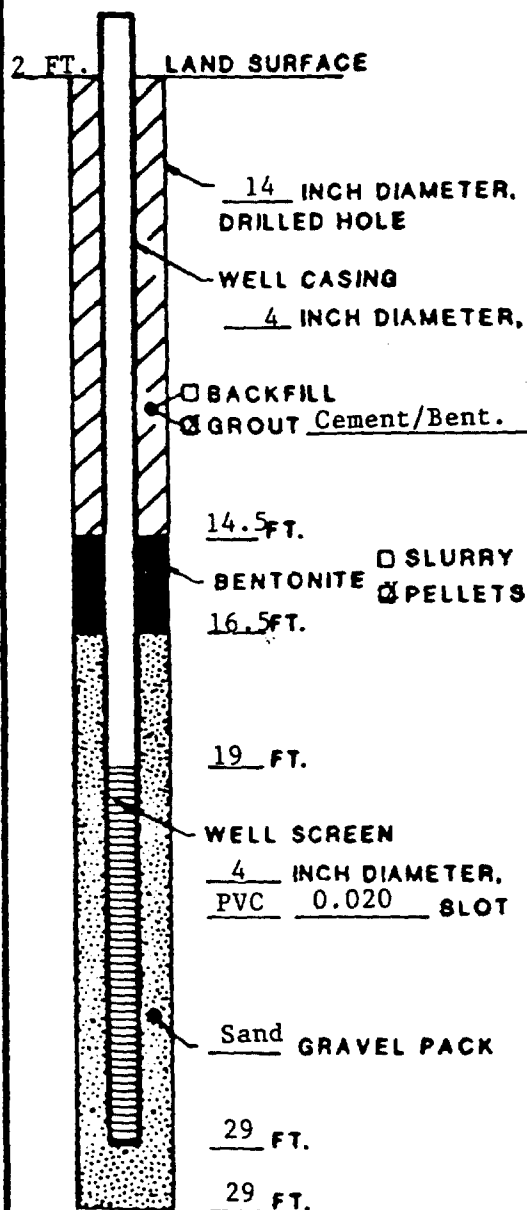
John A. Lagen
Professional Signature

JOHN A. LAGEN
Professional Name
(Please type or print)

SEAL

ENGINEER
Professional License # GE 34148

850130638

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-12D PERMIT NO. 26-201488

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
AND DATUM 9.10 FEET ☐ SURVEYED
☐ ESTIMATED

INSTALLATION DATE(S) 5/11/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR _____

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 175 GALLONS

STATIC DEPTH TO WATER 8.85 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.75 HOURS

YIELD 3.5 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter steel
outer casing to 15.5'.

HYDROGEOLOGIST J. Powley

850130639

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

Well No. 12D
5/10/90 &
Study No. _____ Date 5/11/90
Project 06606J
Client Monsanto
Page 1 of 1
Logged By J. Powley
Loc. _____
M.P. Elevation _____
Drilling Started 5/10/90 Ended 5/11/90
Driller Empire Soils Investigations
Type of Rig Auger and Mud Rotary

WELL DATA
Hole Diam. (in.) 14
Final Depth (ft.) 29 BGS
Casing Diam. (in.) 8 and 4
Casing Interval (ft.) 0 - 19
Screen Interval (ft.) 19 - 29
Screen Slot & Type .020 PVC
Well Status _____

G W READINGS(1)

| Date | DTW MP(2) | Elev.W.T. |
|------|-----------|-----------|
| | | |
| | | |
| | | |

SAMPLER
Type Split Spoon
Hammer 140 lb.
Fall 30 in.

DEVELOPMENT

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-----------|-------------------------------|---------------|--------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 | 1 | 0.5 | 0-2 | 4-11-14-6 | Fill Material | 0 | Black gravelly fill material. |
| 0.0 | 2 | 1.0 | 2-4 | 4-3-3-5 | | 2 | |
| 0.0 | 3 | 0.5 | 4-6 | 2-3-4-5 | | 4 | -5: Gray medium sand, wet. |
| 0.0 | 4 | 1.7 | 6-8 | 4-4-8-7 | Sand | 6 | -7: Red-brown medium and with some gravel. |
| 0.0 | 5 | 2.0 | 8-10 | 6-5-4-5 | | 8 | Gray medium to coarse sand, wet. |
| 0.0 | 6 | 2.0 | 10-12 | 4-3-3-4 | | 10 | |
| 0.0 | 7 | 2.0 | 12-14 | 3-2-2-2 | Peat | 12 | -13: Peat |
| 0.0 | 8 | 1.1 | 15-17 | 1-1-1-2 | | 14 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130640

MO06606J.2.47 7.90

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>12D</u>
Study No. _____ Date <u>5/10/90 & 5-11-90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>2</u> of <u>2</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/10/90</u> Ended <u>5/11/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Auger and Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>29 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 19</u>
Screen Interval (ft.) <u>19 - 29</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| OVM (ppm) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|---------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| | | | | | Peat | 16 | |
| 0.0 | 9 | 2.0 | 17-19 | 3-5-7-10 | _____ | 18 | Brown silty medium sand, wet.
-18.5: Red silty medium sand, wet. |
| 0.0 | 10 | 1.3 | 19-21 | 4-10-11-11 | Sand | 20 | -19: Gray medium sand, wet. |
| 0.0 | 11 | 1.3 | 21-23 | 13-12-13-13 | | 21-23 | Gray medium sand, wet. |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130641

MO06606J.2.47 7.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number: _____

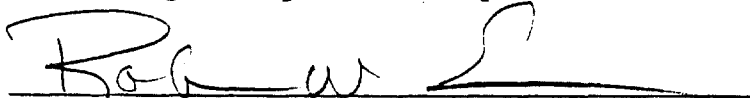
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20148 - 8
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-02.48"
Latitude (one tenth of a second): North 40°-44'-30.34"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.22'PVC, 11.41'CASING, 9.10'GRND
Owners Well Number (As shown on application
or plans): MW-12D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130642

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):

This number must be permanently affixed to the well casing.

2 6 2 0 1 4 9 6

Owner's Well Number (As shown on the application or plans):

MW-13D

Well Completion Date:

5-4-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.40

Total Depth of Well (one-tenth of a foot):

30.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

22.40

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

8.45

Yield (Gallons per Minute):

4 GPM

Length of time Well Pumped or Bailed:

Hours 25 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

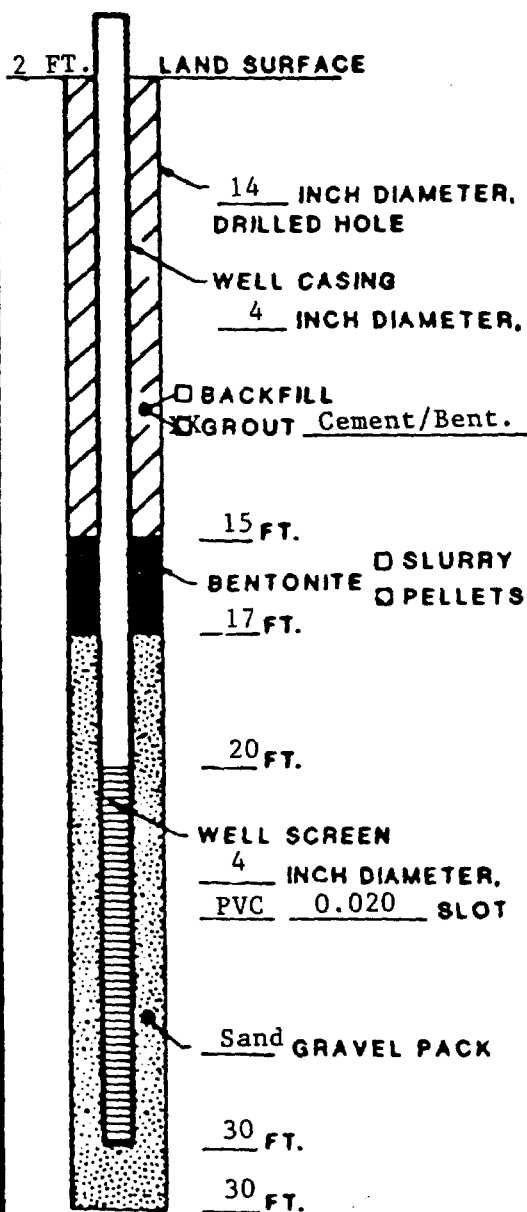
Professional Signature

Professional Name
(Please type or print)

Professional License #

SEAL

850130643

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC.**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACEPROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-13D PERMIT NO. 26-201496TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 8.39 FEET ☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/4/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 104 GALLONSSTATIC DEPTH TO WATER 8.45 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.45 HOURSYIELD 4 GPM 5/17/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring WellREMARKS Double-cased well: 8 inch diameter steel
outer casing to 8 feet.HYDROGEOLOGIST J. Powley

850130644

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>13D</u>

Study No. _____ Date <u>05/02/90 &</u>
Project <u>06606J</u> <u>05/04/90</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/4/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 14</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|------------|------------|-------------------------------|---------------|-----------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 13.5-15.5' | 1-1-1-1 | Peat | 13 | Peat. |
| 0.0 ppm | 2 | 2.0 | 15.5-17.5' | 5-4-4-4 | | 15 | |
| | | | | | | 17 | Gray brown fine to medium sand with some silt, wet. |
| 0.0 ppm | 3 | 2.0' | 17.5-19.5' | 10-19-9-14 | | 19 | |
| 0.0 ppm | 4 | 1.0' | 19.5-21.5' | 2-7-7-8 | | 21 | |
| 0.0 ppm | 5 | 1.8' | 21.5-23.5' | 5-7-7-13 | | 23 | 22": Red brown medium sand, wet. |
| 0.0 ppm | 7 | 1.3' | 25.5-27.5 | 4-7-5-6 | Silt and Clay | 25 | Gray silt and varved clay, wet. |
| 0.0 ppm | 8 | 1.3' | 27.5-29.5 | 6-10-10-11 | | 27 | Gray silt and varved clay, wet. |
| | | | | | | 29 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130645

MO06606J.2.19 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number: _____

LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20149 - 6
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°07'-09.33"
Latitude (one tenth of a second): North 40°44'-30.06"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.79'PVC, 11.39'CASING, 8.39'GRND
Owners Well Number (As shown on application
or plans): MW-13D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130646

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 5 0 0

Owner's Well Number (As shown on the application or plans):

MW-14D

Well Completion Date:

5-2-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.55

Total Depth of Well (one-tenth of a foot):

27.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

19.55

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

9.50

Yield (Gallons per Minute):

4 GPM

Length of time Well Pumped or Bailed:

Hours 15 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LOPEZ

Professional Name
(Please type or print)

ENGINEER

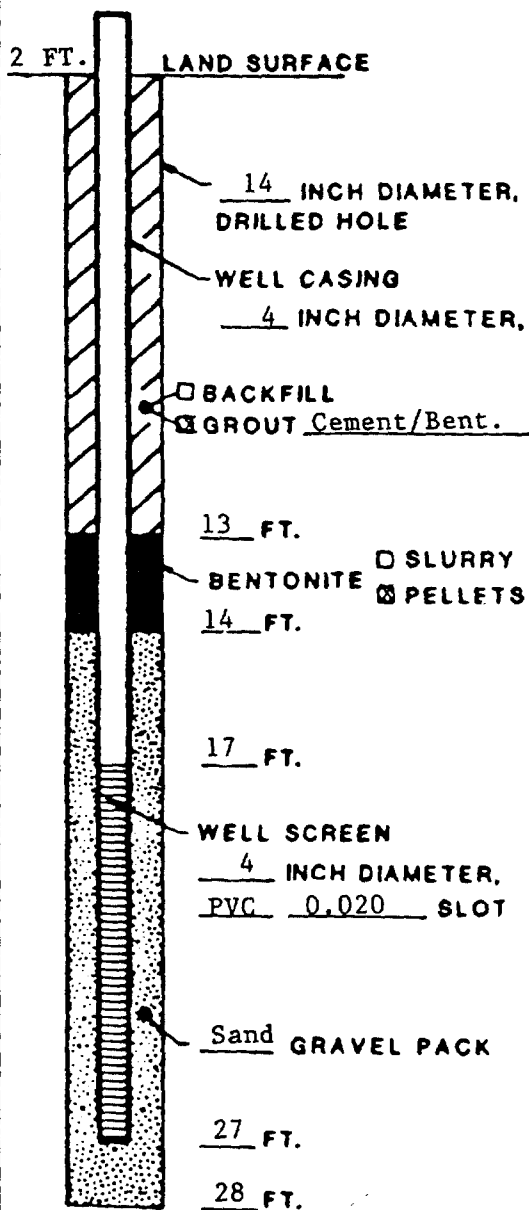
GE 34148

Professional License #

SEAL

850130647

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-14D PERMIT NO. 26-201500

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
AND DATUM 8.37 FEET ☐ SURVEYED ☐ ESTIMATED

INSTALLATION DATE(S) 5/2/90

DRILLING METHOD Mud Rotary

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Submersible Pump 5/17/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 60 GALLONS

STATIC DEPTH TO WATER 9.5 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.25 HOURS

YIELD 4 GPM 5/17/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Double-cased well: 8 inch diameter outer steel casing to 11.8'.

HYDROGEOLOGIST J. Powley

850130648

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>14D</u>

Study No. _____ Date <u>05/02/90</u> &
Project <u>06606J</u> <u>05/03/90</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/3/90</u>
Driller <u>Empire Soils Investigations</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>27 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 17</u>
Screen Interval (ft.) <u>17 - 27</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|--------|------------|-----------|-------------------------------|---------------|----------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 7-9' | 4-6-5-6 | Medium Sand | 7 | Gray to reddish-brown medium sand with some gravel, wet. |
| 0.0 ppm | 2 | 2.0' | 9-11' | 2-1-1-1 | Peat | 9 | 10': Peat. |
| 0.0 ppm | 3 | 1.6' | 11-13' | 2-1-2-3 | | 11 | |
| 0.0 ppm | 4 | 1.7' | 13-15' | 1-2-2-4 | | 13 | |
| 0.0 ppm | 5 | 1.8' | 15-17' | 5-8-10-14 | Sand | 15 | 15.6': Grayish-brown silty medium sand, wet. |
| 0.0 ppm | 6 | 2.0' | 17-19' | 5-6-8-9 | | 17 | Gray gravelly coarse sand, wet. |
| 0.0 ppm | 7 | 19-21' | 9-10-10-10 | | | 19 | |
| | | | | | | 21 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130649

MO06606J.2.17 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDDES Number: _____

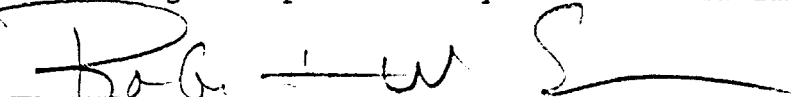
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20150 - 0
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-05.04"
Latitude (one tenth of a second): North 40°-44'-28.30"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 10.92'PVC, 11.12'CASING, 8.37'GRND
Owners Well Number (As shown on application
or plans): MW-14D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.


PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDDES permit.

850130650

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 5 1 8

Owner's Well Number (As shown on the application or plans):

MW-15D

Well Completion Date:

5-3-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

-0.29

Total Depth of Well (one-tenth of a foot):

30.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

19.71

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

6.40

Yield (Gallons per Minute):

6 GPM

Length of time Well Pumped or Bailed:

Hours 15 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN R. LOPER

Professional Name
(Please type or print)

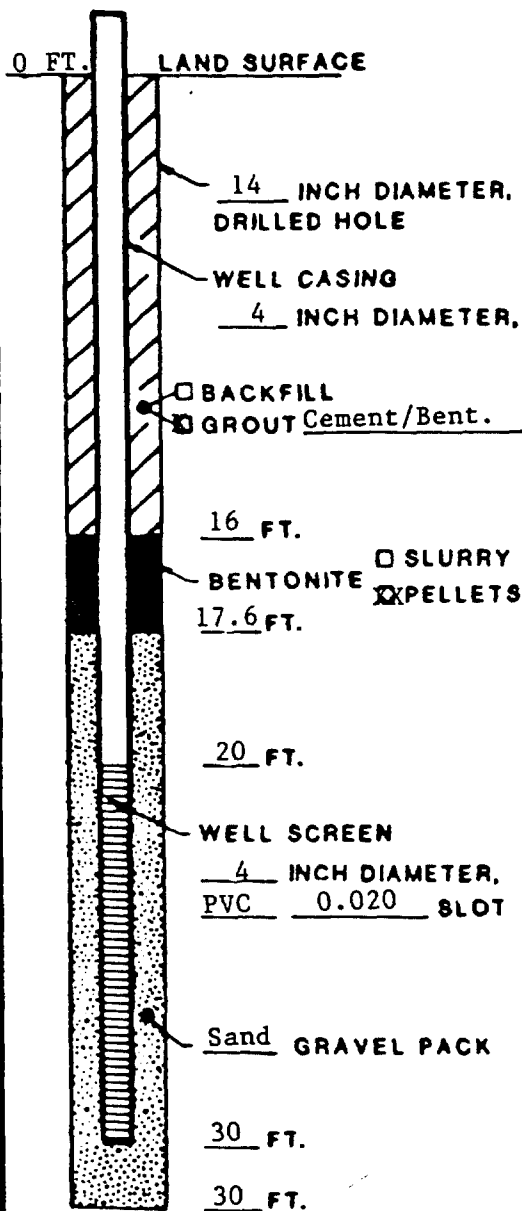
ENGINEER

GG 34148

Professional License #

SEAL

850130651

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC**MONITORING WELL
CONSTRUCTION LOG****NOTE:**ALL DEPTHS IN FEET
BELOW LAND SURFACEPROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-15D PERMIT NO. 26-201518TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 9.05 FEET☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/3/90DRILLING METHOD Mud RotaryDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID Water

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Submersible Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 90 GALLONSSTATIC DEPTH TO WATER 6.4 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.25 HOURSYIELD 6 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring WellREMARKS Flush Mount-Double cased: 8 inch outer steel casing to 15 feet.HYDROGEOLOGIST J. Powley

850130652

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>15D</u>

Study No. _____ Date <u>05/02/90</u>
Project <u>06606J</u> <u>05/03/90</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>5/2/90</u> Ended <u>5/3/90</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Mud Rotary</u> | WELL DATA
Hole Diam. (in.) <u>14</u>
Final Depth (ft.) <u>30 BGS</u>
Casing Diam. (in.) <u>8 and 4</u>
Casing Interval (ft.) <u>0 - 20</u>
Screen Interval (ft.) <u>20 - 30</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____

SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|--|--|--|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | DEVELOPMENT | | | | | | | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|-----------|-------------|-------------------------------|---------------|-------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.9' | 17-19' | 29-24-24-26 | Peat | 17 | Peat.
18': Gray brown silty medium sand, wet. |
| 0.0 ppm | 2 | 2.0' | 19-21' | 23-33-39-41 | Silty Sand | 19 | Gray gravelly coarse sand, wet.
20': Gray brown silty medium sand, wet. |
| 0.0 ppm | 3 | 1.1' | 21-23' | 17-19-15-10 | | 21 | |
| 0.0 ppm | 4 | 1.8' | 23-25' | 10-11-12-12 | | 23 | 24.5': Gray brown silty fine sand, wet. |
| 0.0 ppm | 5 | ? | 25-27' | 2-1-1-2 | | 25 | Note: Sample slipped out of split spoon
after being removed from borehole. |
| 0.0 ppm | 6 | 1.7' | 27-29' | 5-8-8-4 | | 27 | Gray brown silty fine sand, wet. |
| | | | | | | 29 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130653

MO06606J.2.18 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

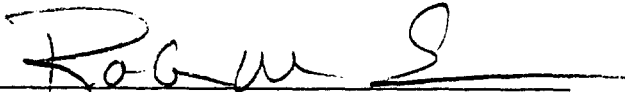
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20151 - 8
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-00.02"
Latitude (one tenth of a second): North 40°-44'-30.23"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 8.76'PVC, 9.13'CASING, 9.05'GRND
Owners Well Number (As shown on application
or plans): MW-15D

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

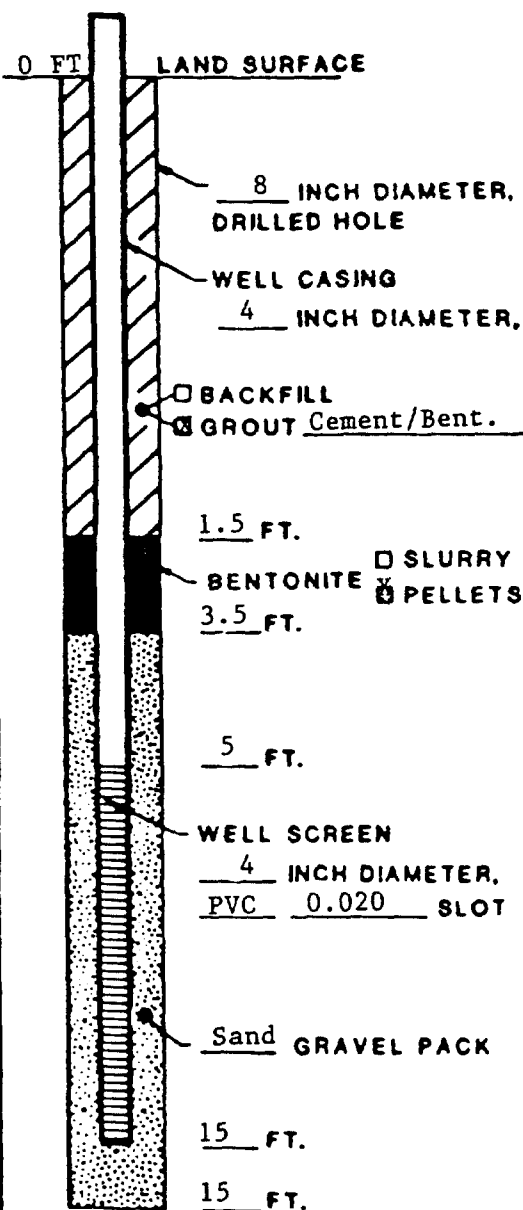
SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130654

MONITORING WELL CONSTRUCTION LOG



NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606J

WELL NO. MW-15S PERMIT NO. 26-201399

TOWN/CITY Kearny

COUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION
AND DATUM 8.98 FEET ☒ SURVEYED
☐ ESTIMATED

INSTALLATION DATE(S) 5/1/90

DRILLING METHOD Hollow Stem Auger

DRILLING CONTRACTOR Empire Soils Investigations

DRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)
Peristaltic Pump 5/21/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 62 GALLONS

STATIC DEPTH TO WATER 2.0 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION _____ HOURS

YIELD 1.75 GPM 5/21/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS Flush-Mount Well

HYDROGEOLOGIST J. Powley

850130655

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

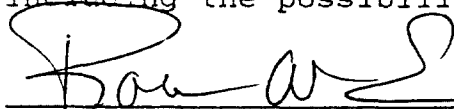
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20139 - 9
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74-06'-59.91"
Latitude (one tenth of a second): North 40-44'-30.22"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 8.68'PVC, 9.10'CASING, 8.98'GRND
Owners Well Number (As shown on application
or plans): MW-15S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130656

GROUND WATER
MONITORING WELL CERTIFICATION - FORM - A - AS-BUILT CERTIFICATION
(One form must be completed for each well)

Name of Permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue; Kearny, NJ
NJPDES Permit No: Not Applicable

ENGINEER'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's Water Allocation Section (609-984-6831):
This number must be permanently affixed to the well casing.

2 6 2 0 1 4 0 2

Owner's Well Number (As shown on the application or plans):

MW-16S

Well Completion Date:

5-1-90

Distance from Top of Casing (cap off) to ground surface (one-hundredth of a foot):

2.04

Total Depth of Well (one-tenth of a foot):

13.00 (from land surface)

Depth to Top of Screen From Top of Casing (one-tenth of a foot):

5.04

Screen Length (feet):

10.00

Screen or Slot Size:

.020

Screen Material:

PVC

Casing Material: (PVC, Steel or Other-Specify):

PVC

Casing Diameter: (Inches):

4.00

Static Water Level From Top of Casing at The

Time of Certification (one-hundredth of a foot):

5.65

Yield (Gallons per Minute):

4.5 GPM

Length of time Well Pumped or Bailed:

Hours 30 Minutes

Lithologic Log:

ATTACH ON BACK

AUTHENTICATION:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitted false information including the possibility of fine and imprisonment.

Professional Signature

JOHN A. LOGER

Professional Name
(Please type or print)

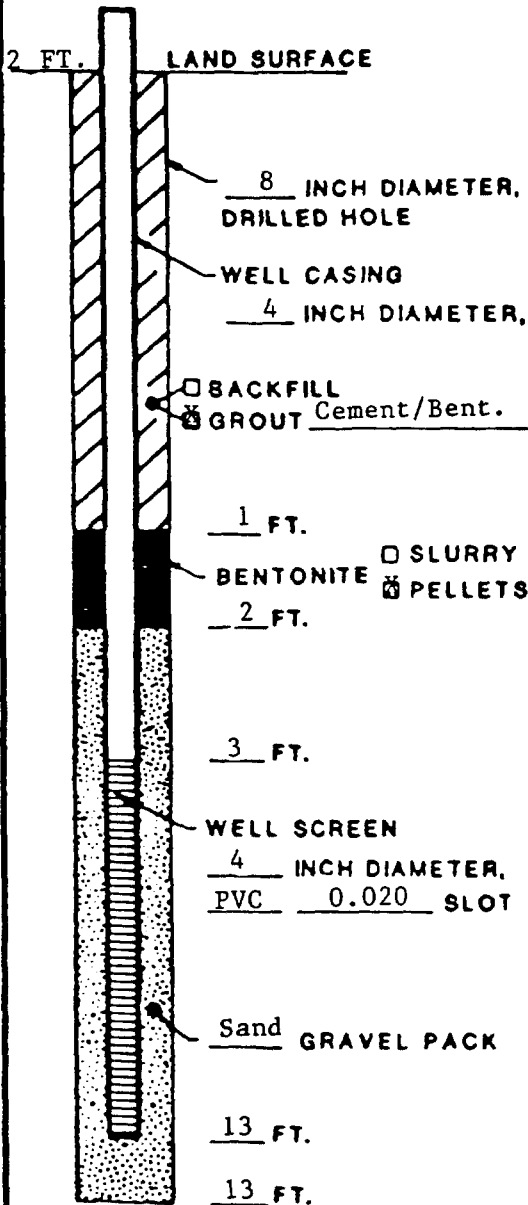
SEAL

Professional License #

ENGINEER

GE 34148

850130657

ROUXConsulting Ground-Water Geologists
ROUX ASSOCIATES INC.**MONITORING WELL
CONSTRUCTION LOG**

NOTE:
ALL DEPTHS IN FEET
BELOW LAND SURFACE

PROJECT NAME Monsanto Kearny Plant NUMBER 06606JWELL NO. MW-16S PERMIT NO. 26-201402TOWN/CITY KearnyCOUNTY Hudson STATE NJ

LAND-SURFACE ELEVATION

AND DATUM 9.31 FEET☒ SURVEYED☐ ESTIMATEDINSTALLATION DATE(S) 5/1/90DRILLING METHOD Hollow Stem AugerDRILLING CONTRACTOR Empire Soils InvestigationsDRILLING FLUID NA

DEVELOPMENT TECHNIQUE(S) AND DATE(S)

Peristaltic Pump 5/18/90

FLUID LOSS DURING DRILLING _____ GALLONS

WATER REMOVED DURING DEVELOPMENT 135 GALLONSSTATIC DEPTH TO WATER 5.65 FEET BELOW M.P.

PUMPING DEPTH TO WATER _____ FEET BELOW M.P.

PUMPING DURATION 0.5 HOURSYIELD 4.5 GPM 5/18/90 DATE _____

SPECIFIC CAPACITY _____ GPM/FT.

WELL PURPOSE Monitoring Well

REMARKS _____

HYDROGEOLOGIST J. Powley

850130658

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>15S</u>

Study No. _____ Date <u>05/01/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>13:00</u> Ended <u>14:55</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>15 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0 - 5</u>
Screen Interval (ft.) <u>5 - 15</u>
Screen Slot & Type <u>.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|--------------|-------------|-------------------------------|---------------|----------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.3' | 0-1'
1-3' | 15-23-42-40 | Fill Material | 1 | Black fill material.
Dark gray to black silty sandy fill material with gravel, wet. |
| 1.4 ppm | 2 | 1.3' | 3-5' | 15-16-42-40 | | 3 | 3.5': Light gray medium to coarse sand with gravel, wet. No odors. |
| 0.2 ppm | 3 | 1.6' | 5-7' | 8-9-10-14 | | 5 | |
| 0.2 ppm | 4 | 2.0' | 7-9' | 9-15-15-18 | Medium Sand | 7 | Light gray to brown medium sand with silt, wet. |
| 0.2 ppm | 5 | 1.1' | 9-11' | 32-30-27-30 | | 9 | |
| 0.0 ppm | 6 | 2.0' | 11-13' | 6-11-7-9 | | 11 | |
| 0.0 ppm | 7 | 2.0' | 13-15' | 2-2-2-4 | Peat | 13 | Peat. |
| 0.0 ppm | 8 | 2.0' | 15-17' | 2-3-2-3 | | 15 | |

REMARKS: (1) in feet relative to a common datum
(2) from top of PVC casing

850130659

MO06606J.2.16 6.90

THIS FORM MUST BE COMPLETED BY THE PERMITEE OR HIS/HER AGENT

GROUND WATER MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of permittee: Monsanto Company
Name of Facility: Monsanto Kearny Plant
Location: Pennsylvania Avenue, Kearny, New Jersey
NJPDES Number:

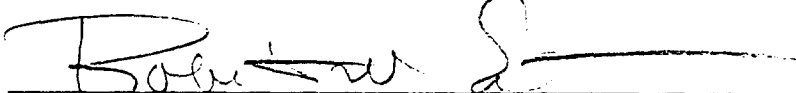
LAND SURVEYOR'S CERTIFICATION

Well Permit Number (As assigned by NJDEP's
Water Allocation Section, 609-984-6831): 26 - 20140 - 2
This number must be permanently affixed to
the well casing.

Longitude (one tenth of a second): West 74°-07'-11.40"
Latitude (one tenth of a second): North 40°-44'-31.87"
Elevation of Top of Casing (cap off)
(one-hundredth of a foot) 11.35'PVC, 11.85'CASING, 9.31'GRND
Owners Well Number (As shown on application
or plans): MW-16S

AUTHENTICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.



PROFESSIONAL LAND SURVEYOR'S SIGNATURE

Robert W. Ent
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

20801
PROFESSIONAL LAND SURVEY'S LICENCE #

The department reserves the right in cases of violation of permit specified ground water limits or ground Quality Standards (N.J.A.C. 7:9-6.1 et seq.) to require that wells be resurveyed to an accuracy of one-hundredth of a second latitude and longitude. This shall not be considered to be a major modification of the NJPDES permit.

850130660

ROUX ASSOCIATES, INC.
CONSULTING GROUND-WATER GEOLOGISTS

GEOLOGIC LOG

| Well No. <u>16S</u>

Study No. _____ Date <u>5/1/90</u>
Project <u>06606J</u>
Client <u>Monsanto</u>
Page <u>1</u> of <u>1</u>
Logged By <u>J. Powley</u>
Loc. _____
M.P. Elevation _____
Drilling Started <u>09:00</u> Ended <u>11:02</u>
Driller <u>Empire Soils Investigation</u>
Type of Rig <u>Hollow Stem Auger</u> | WELL DATA
Hole Diam. (in.) <u>8</u>
Final Depth (ft.) <u>13 BGS</u>
Casing Diam. (in.) <u>4</u>
Casing Interval (ft.) <u>0 - 3</u>
Screen Interval (ft.) <u>3 - 13</u>
Screen Slot & Type <u>0.020 PVC</u>
Well Status _____ | G W READINGS(1)
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:33%;">Date</th> <th style="width:33%;">DTW MP(2)</th> <th style="width:33%;">Elev.W.T.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table> | Date | DTW MP(2) | Elev.W.T. | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--|--|--|
| Date | DTW MP(2) | Elev.W.T. | | | | | | |
| | | | | | | | | |
| SAMPLER
Type <u>Split Spoon</u>
Hammer <u>140</u> lb.
Fall <u>30</u> in. | | DEVELOPMENT | | | | | | |

| Elev. (1) | SAMPLE | | | | Strata Change
& Gen. Desc. | Depth
(ft) | SAMPLE DESCRIPTION |
|-----------|--------|------|--------------|-------------|-------------------------------|---------------|---------------------------------------------------------------------------------------------------|
| | No. | Rec. | Depth(ft) | Blow/6" | | | |
| 0.0 ppm | 1 | 1.5' | 0-1'
1-3' | 24-33-30-43 | | 1 | Brown to black fill material with sand, silt and gravel. |
| 0.0 ppm | 2 | 1.2' | 3-5' | 13-6-7-9 | Fill Material | 3 | Brown to black fill material with sand, silt and gravel. Organic odor present, wet. |
| 9.0 ppm | 3 | 1.0' | 5-7' | 10-4-7-6 | | 5 | Brown to black fill material with sand, silt and gravel. Organic odor present, wet. |
| 0.0 ppm | 4 | 1.8' | 7-9' | 6-6-4-5 | | 7 | 7.7: Reddish brown silty medium sand with gravel, wet, no odor. |
| 1.0 ppm | 5 | 0.8' | 9-11' | 2-1-2-4 | Silty Sand | 9 | Black to brown silty medium to coarse silty sand with some gravel, hydrocarbon odor present, wet. |
| 0.0 ppm | 6 | 2' | 11-13' | 2-2-2-2 | | 11 | |
| | | | | | Peat | | 12.5': Peat, no odor, wet. |
| | | | | | | 13 | |

REMARKS: (1) in feet relative to a common datum
 (2) from top of PVC casing

850130661

MO06606J.2.15 6.90

APPENDIX F
Ground-Water Monitoring Logs.

WELL MONITORING LOG

Client: Monsanto Chemical Company

Date: April 5, 1991

Site Location: Kearny, NJ

Time In: 0800 **Time Out:** 1830

Project Number: 06606J

Weather Conditions: Heavy Rain

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|---------------------------------------|
| MW-3D | 11.02 | -- | 9.12 | -- | 1.90 | Measurement from top of steel casing. |
| MW-6D | 11.46 | -- | 9.54 | -- | 1.92 | |
| MW-7D | 10.80 | -- | 9.02 | -- | 1.78 | |
| MW-8D | 9.74 | -- | 9.61 | -- | 0.13 | |
| MW-9D | 9.45 | -- | 7.47 | -- | 1.98 | Measurement from top of steel casing. |
| MW-10D | 11.58 | -- | 9.63 | -- | 1.95 | |
| MW-11D | 11.04 | -- | 9.16 | -- | 1.88 | |
| MW-12D | 11.22 | -- | 9.37 | -- | 1.85 | |
| MW-13D | 10.79 | -- | 9.69 | -- | 1.10 | |
| MW-14D | 10.92 | -- | 10.89 | -- | 0.03 | |
| MW-15D | 8.76 | -- | 6.87 | -- | 1.89 | |
| | | | | | | |

Depth in Holding Tank Before Bailing (ft): _____ **Product:** _____ **Water:** _____ **Total:** _____

Depth in Holding Tank After Bailing (ft): _____ **Product:** _____ **Water:** _____ **Total:** _____

Comments: Lower Water Bearing Zone Wells

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeffrey C. Powley **Date:** April 5, 1991

850130663

MO06606J.7.1 4.91

WELL MONITORING LOG

Client: Monsanto Chemical Company

Date: March 18 and 19, 1991

Site Location: Kearny, NJ

Time In: 0800 **Time Out:** 1830

Project Number: 06606J

Weather Conditions: Heavy Rain

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|---------------------------------------|
| MW-1S | 10.73 | — | 3.92 | — | 6.81 | |
| MW-3S | 11.25 | — | 4.53 | — | 6.72 | Measurement from top of steel casing. |
| MW-4S | 11.55 | — | 4.85 | — | 6.70 | |
| MW-5S | 11.81 | — | 5.32 | — | 6.49 | |
| MW-6S | 11.75 | — | 5.88 | — | 5.87 | Measurement from top of steel casing. |
| MW-7S | 10.37 | — | 3.92 | — | 6.45 | |
| MW-8S | 8.83 | — | 7.18 | — | 1.65 | |
| MW-9S | 10.88 | — | 4.52 | — | 6.36 | |
| MW-10S | 12.15 | — | 5.55 | — | 6.60 | Measurement from top of steel casing. |
| MW-11S | 9.97 | — | 4.06 | — | 5.91 | |
| MW-12S | 10.46 | — | 4.43 | — | 6.03 | |
| MW-13S | 10.02 | — | 4.55 | — | 5.47 | |

Depth in Holding Tank Before Bailing (ft): Product: NA Water: NA Total: NA

Depth in Holding Tank After Bailing (ft): Product: NA Water: NA Total: NA

Comments: Upper Water-Bearing Zone Wells

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeffrey C. Powley **Date:** March 19, 1991

850130664

MO06606J.7.1 4.91

WELL MONITORING LOG

Client: Monsanto Chemical Company

Date: March 18 and 19, 1991

Site Location: Kearny, NJ

Time In: 0800 Time Out: 1830

Project Number: 06606J

Weather Conditions: Heavy Rain

[illegible]

Depth in Holding Tank Before Bailing (ft): _____ **Product:** _____ **Water:** _____ **Total:** _____

Depth in Holding Tank After Bailing (ft): _____ **Product:** _____ **Water:** _____ **Total:** _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit:_____

Name/Signature: Jeffrey C. Powley **Date:** March 19, 1991

850130665

MO06606J.7.1 4.91

WELL MONITORING LOG

Page 1 of 3

Client: MonsantoDate: December 11, 1990Site Location: Kearny PlantTime In: 0900 Time Out: 1715Project Number: 06606JWeather Conditions: Cloudy, cold: 35 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-1S | 11.33 | -- | 4.00 | -- | 7.33 | Measurement from top of steel casing |
| MW-3S | 11.25 | -- | 4.67 | -- | 6.58 | Measurement from top of steel casing |
| MW-3D | 11.02 | -- | 9.30 | -- | 1.72 | Measurement from top of steel casing |
| MW-4S | 12.12 | -- | 5.72 | -- | 6.40 | Measurement from top of steel casing |
| MW-5S | 12.50 | -- | 6.60 | -- | 5.90 | Measurement from top of steel casing |
| MW-6S | 11.75 | -- | 6.15 | -- | 5.60 | Measurement from top of steel casing |
| MW-6D | 11.46 | -- | 9.57 | -- | 1.89 | |
| MW-7S | 10.37 | -- | 4.68 | -- | 5.69 | |
| MW-7D | 10.80 | -- | 9.03 | -- | 1.77 | |
| MW-8S | 8.83 | -- | 6.50 | -- | 2.33 | |
| MW-8D | 9.74 | -- | 8.75 | -- | 0.99 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: December 11, 1990Site Location: Kearny PlantTime In: 0900 Time Out: 1715Project Number: 06606JWeather Conditions: Cloudy, cold: 35 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-9S | 10.88 | - | 4.42 | - | 6.46 | |
| MW-9D | 9.14 | - | 7.12 | - | 2.02 | |
| MW-10S | 12.15 | - | 5.81 | - | 6.34 | Measurement from top of steel casing |
| MW-10D | 11.58 | - | 9.65 | - | 1.93 | |
| MW-11S | 10.87 | - | 5.40 | - | 5.47 | Measurement from top of steel casing |
| MW-11D | 11.24 | - | 9.28 | - | 1.96 | Measurement from top of steel casing |
| MW-12S | 10.46 | - | 4.23 | - | 6.23 | |
| MW-12D | 11.22 | - | 9.55 | - | 1.67 | |
| MW-13S | 11.10 | - | 5.95 | - | 5.15 | Measurement from top of steel casing |
| MW-13D | 10.79 | - | 10.98 | - | -0.19 | |
| MW-14S | 10.71 | - | 5.15 | - | 5.56 | |
| MW-14D | 10.92 | - | 10.37 | - | 0.55 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Page 3 of 3

Client: MonsantoDate: December 11, 1990Site Location: Kearny PlantTime In: 0900 Time Out: 1715Project Number: 06606JWeather Conditions: Cloudy, cold: 35 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------|
| MW-15S | 8.68 | — | 2.55 | — | 6.13 | |
| MW-15D | 8.76 | — | 6.95 | — | 1.81 | |
| MW-16S | 11.35 | — | 6.05 | — | 5.30 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: September 11, 1990Site Location: Kearny PlantTime In: 0800 Time Out: 11700Project Number: 06606JWeather Conditions: Cloudy: 75 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-1S | 11.33 | — | 4.22 | — | 7.11 | Measurement from top of steel casing |
| MW-3S | 11.25 | — | 5.16 | — | 6.09 | Measurement from top of steel casing |
| MW-3D | 11.02 | — | 9.01 | — | 2.01 | Measurement from top of steel casing |
| MW-4S | 12.12 | — | 5.39 | — | 6.73 | Measurement from top of steel casing |
| MW-5S | 12.50 | — | 6.57 | — | 5.93 | Measurement from top of steel casing |
| MW-6S | 11.75 | — | 6.25 | — | 5.50 | Measurement from top of steel casing |
| MW-6D | 11.46 | — | 9.32 | — | 2.14 | |
| MW-7S | 10.37 | — | 4.41 | — | 5.96 | |
| MW-7D | 10.80 | — | 8.70 | — | 2.10 | |
| MW-8S | 8.83 | — | 6.39 | — | 2.44 | |
| MW-8D | 9.74 | — | 7.82 | — | 1.92 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: September 11, 1990Site Location: Kearny PlantTime In: 0800 Time Out: 11700Project Number: 06606JWeather Conditions: Cloudy: 75 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-9S | 10.88 | — | 5.19 | — | 5.69 | |
| MW-9D | 9.14 | — | 7.06 | — | 2.08 | |
| MW-10S | 12.15 | — | 5.99 | — | 6.16 | Measurement from top of steel casing |
| MW-10D | 11.58 | — | 9.36 | — | 2.22 | |
| MW-11S | 10.87 | — | 2.36 | — | 8.51 | Measurement from top of steel casing |
| MW-11D | 11.24 | — | 9.16 | — | 2.08 | Measurement from top of steel casing |
| MW-12S | 10.46 | — | 5.10 | — | 5.36 | |
| MW-12D | 11.22 | — | 9.08 | — | 2.14 | |
| MW-13S | 11.10 | — | 5.89 | — | 5.21 | Measurement from top of steel casing |
| MW-13D | 10.79 | — | 10.90 | — | -0.11 | |
| MW-14S | 10.71 | — | 5.15 | — | 5.56 | |
| MW-14D | 10.92 | — | 9.22 | — | 1.70 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: September 11, 1990Site Location: Kearny PlantTime In: 0800 Time Out: 11700Project Number: 06606JWeather Conditions: Cloudy: 75 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------|
| MW-15S | 8.68 | — | 2.86 | — | 5.82 | |
| MW-15D | 8.76 | — | 6.68 | — | 2.08 | |
| MW-16S | 11.35 | — | 6.09 | — | 5.26 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Page 1 of 3

Client: MonsantoDate: August 29, 1990Site Location: Kearny PlantTime In: 0825 Time Out: 1600Project Number: 06606JWeather Conditions: Sunny, Warm: 72 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-1S | 11.33 | -- | 3.80 | -- | 7.53 | Measurement from top of steel casing |
| MW-3S | 11.25 | -- | 3.47 | -- | 7.78 | Measurement from top of steel casing |
| MW-3D | 11.02 | -- | 8.50 | -- | 2.52 | Measurement from top of steel casing |
| MW-4S | 12.12 | -- | 4.80 | -- | 7.32 | Measurement from top of steel casing |
| MW-5S | 12.50 | -- | 5.26 | -- | 7.24 | Measurement from top of steel casing |
| MW-6S | 11.75 | -- | 5.68 | -- | 6.07 | Measurement from top of steel casing |
| MW-6D | 11.46 | -- | 8.87 | -- | 2.59 | |
| MW-7S | 10.37 | -- | 3.62 | -- | 6.75 | |
| MW-7D | 10.80 | -- | 8.24 | -- | 2.56 | |
| MW-8S | 8.83 | -- | 6.24 | -- | 2.59 | |
| MW-8D | 9.74 | -- | 8.44 | -- | 1.30 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: August 29, 1990Site Location: Kearny PlantTime In: 0825 Time Out: 1600Project Number: 06606JWeather Conditions: Sunny, Warm: 72 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-9S | 10.88 | — | 4.03 | — | 6.85 | |
| MW-9D | 9.14 | — | 6.54 | — | 2.60 | |
| MW-10S | 12.15 | — | 3.98 | — | 8.17 | Measurement from top of steel casing |
| MW-10D | 11.58 | — | 8.94 | — | 2.64 | |
| MW-11S | 10.87 | — | 3.72 | — | 7.15 | Measurement from top of steel casing |
| MW-11D | 11.24 | — | 8.70 | — | 2.54 | Measurement from top of steel casing |
| MW-12S | 10.46 | — | 3.56 | — | 6.90 | |
| MW-12D | 11.22 | — | 8.70 | — | 2.52 | |
| MW-13S | 11.10 | — | 4.40 | — | 6.70 | Measurement from top of steel casing |
| MW-13D | 10.79 | — | 9.58 | — | 1.21 | |
| MW-14S | 10.71 | — | 4.75 | — | 5.96 | |
| MW-14D | 10.92 | — | 8.84 | — | 2.08 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Page 3 of 3

Client: MonsantoDate: August 29, 1990Site Location: Kearny PlantTime In: 0825 Time Out: 1600Project Number: 06606JWeather Conditions: Sunny, Warm: 72 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------|
| MW-15S | 8.68 | -- | 1.85 | -- | 6.83 | |
| MW-15D | 8.76 | -- | 6.12 | -- | 2.64 | |
| MW-16S | 11.35 | -- | 5.63 | -- | 5.72 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: June 11, 1990Site Location: Kearny PlantTime In: 0720 Time Out: 1920Project Number: 06606JWeather Conditions: Partly Cloudy, Windy: 65 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-1S | 11.33 | - | 4.17 | - | 7.16 | Measurement from top of steel casing |
| MW-3S | 11.25 | - | 4.79 | - | 6.46 | Measurement from top of steel casing |
| MW-3D | 11.02 | - | 9.07 | - | 1.95 | Measurement from top of steel casing |
| MW-4S | 12.12 | - | 5.72 | - | 6.40 | Measurement from top of steel casing |
| MW-5S | 12.50 | - | 6.45 | - | 6.05 | Measurement from top of steel casing |
| MW-6S | 11.75 | - | 6.08 | - | 5.67 | Measurement from top of steel casing |
| MW-6D | 11.46 | - | 9.47 | - | 1.99 | |
| MW-7S | 10.37 | - | 4.25 | - | 6.12 | |
| MW-7D | 10.80 | - | 8.91 | - | 1.89 | |
| MW-8S | 8.83 | - | 6.65 | - | 2.18 | |
| MW-8D | 9.74 | - | 8.30 | - | 1.44 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: June 11, 1990Site Location: Kearny PlantTime In: 0720 Time Out: 1920Project Number: 06606JWeather Conditions: Partly Cloudy, Windy: 65 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------------------------------|
| MW-9S | 10.88 | -- | 5.04 | -- | 5.84 | |
| MW-9D | 9.14 | -- | 7.15 | -- | 1.99 | |
| MW-10S | 12.15 | -- | 5.86 | -- | 6.29 | Measurement from top of steel casing |
| MW-10D | 11.58 | -- | 9.60 | -- | 1.98 | |
| MW-11S | 10.87 | -- | 4.54 | -- | 6.33 | Measurement from top of steel casing |
| MW-11D | 11.24 | -- | 9.26 | -- | 1.98 | Measurement from top of steel casing |
| MW-12S | 10.46 | -- | 4.75 | -- | 5.71 | |
| MW-12D | 11.22 | -- | 9.35 | -- | 1.87 | |
| MW-13S | 11.10 | -- | 4.79 | -- | 6.31 | Measurement from top of steel casing |
| MW-13D | 10.79 | -- | 9.04 | -- | 1.75 | |
| MW-14S | 10.71 | -- | 5.03 | -- | 5.68 | |
| MW-14D | 10.92 | -- | 9.05 | -- | 1.87 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

WELL MONITORING LOG

Client: MonsantoDate: June 11, 1990Site Location: Kearny PlantTime In: 0720 Time Out: 1920Project Number: 06606JWeather Conditions: Partly Cloudy, Windy: 65 °F

| Well # | Casing Elev. (ft) | Depth to Product (ft) | Depth to Water (ft) | Product Thick. (ft) | Corrected Water-Table Elevation | Observations |
|--------|-------------------|-----------------------|---------------------|---------------------|---------------------------------|--------------|
| MW-15S | 8.68 | -- | 2.23 | -- | 6.45 | |
| MW-15D | 8.76 | -- | 6.75 | -- | 2.01 | |
| MW-16S | 11.35 | -- | 5.98 | -- | 5.37 | |

Depth in Holding Tank Before Bailing (ft): Product: _____ Water: _____ Total: _____

Depth in Holding Tank After Bailing (ft): Product: _____ Water: _____ Total: _____

Comments: _____

Additional Equipment and/or Services Required During Next Monitoring Visit: _____

Name/Signature: Jeff Powley Date: _____

APPENDIX G
Tidal Data and Graphs.

Let's protect our earth



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
TRENTON

Division of Coastal Resources

Please address reply to:
CN 401
Trenton, N.J. 08625-0401

October 16, 1990

Roux Associates
701 Cooper Road
Suite 12
Voorhees, New Jersey 08043

Attention: Jeff Powley

Dear Mr. Powley:

As per our phone conversation, I am sending you a copy of
Tidal Datum Information for the following tide gauge
station:

853-0743 Point No Point, Passaic River

This information includes a Tidal Datum and Bench Mark
Sheet, a regional and site specific locator map, and Tidal
Bench Mark descriptions.

If I can be of further assistance to you, please call (609)
292-2573. An invoice is attached.

Sincerely,

Richard G. Castagna
Supervising Environmental
Specialist, Bureau of
Tidelands

Attach



850130680

74° 08'

74° 06'

marsh

marsh

marsh

marsh

marsh

marsh

marsh

marsh

CHY

LIFT BRIDGE
HOR. CL. 300 FT.
VERT. CL. 35 FT. DOWN
VERT. CL. 135 FT. UP

FIXED BRIDGE

SWING BRIDGE
HOR. CL. 100 FT.
VERT. CL. 25 FT.

FIXED BRIDGE
HOR. CL. 319 FT.
VERT. CL. 100 FT.

FIXED BRIDGE
HOR. CL. 520 FT.
VERT. CL. 135 FT.

SWING BRIDGE
HOR. CL. N. DRAW 103 FT.
HOR. CL. S. DRAW 104 FT.
VERT. CL. 16 FT.

DIVID PWR CABLES
CL. 135 FT.

LIFT BRIDGE
HOR. CL. 168 FT.
VERT. CL. 40 FT.
VERT. CL. 135 FT.

POINT NO POINT - Passaic R.

853 0743

LIFT BRIDGE
HOR. CL. 135 FT. DOWN
VERT. CL. 135 FT. UP

LIFT BRIDGE
HOR. CL. 200 FT.
VERT. CL. 35 FT. DOWN
VERT. CL. 135 FT. UP

KEARNY POINT

Droyers Point

39

38

Point No Point River

P. A. S. S. A. I. C.

KEARNY POINT REACH

DROYERS POINT REACH

HACKENSACK

Cable Area

Pipeline and Cable Area

Cable Area

C.R.R. of N.J.

Obstr ED

18 FT 1968

L.V.R.R.

diagonal

diagonal

diagonal

diagonal

RUN DATE: 86/ 6/24

TIDAL DATUMS AND BENCH MARK ELEVATION SHEET

8530743 POINT NO POINT PASSAIC RIVER NJ

TIDAL DATUMS AT THIS STATION ARE BASED ON THE FOLLOWING:

| | |
|------------------|---------------------------------|
| LENGTH OF SERIES | = 11 MONTHS |
| TIME PERIOD | = 76 1 TO 76 11 |
| TIDAL EPOCH | = 1966-1984 |
| CONTROL STATION | = 8518750 <u>THE BATTERY NY</u> |

ELEVATIONS OF TIDAL DATUMS REFERRED TO MEAN LOWER LOW WATER (MLLW) ARE AS FOLLOWS:

| | |
|---------------------------------------------------|-------------|
| MEAN HIGHER HIGH WATER (MHHW) | = 5.81 FEET |
| MEAN HIGH WATER (MHW) | = 5.49 FEET |
| MEAN TIDE LEVEL (MTL) | = 2.86 FEET |
| *NATIONAL GEODETIC VERTICAL DATUM-
1929 (NGVD) | = 2.04 FEET |
| MEAN LOW WATER (MLW) | = 0.23 FEET |
| MEAN LOWER LOW WATER (MLLW) | = 0.00 FEET |

*NGVD IS BASED ON ELEVATIONS PUBLISHED IN QUAD 400741, 12/82
AND NOS LEVELING OF 12/28/76

BENCH MARK ELEVATION INFORMATION:

| BENCH MARK STAMPING | ELEVATION IN FEET ABOVE : | |
|---------------------|---------------------------|-------|
| | MLLW | MHW |
| 0743 B 1975 | 9.67 | 4.18 |
| 0743 A 1975 | 11.08 | 5.59 |
| 0743 C 1975 | 10.77 | 5.28 |
| 0743 D 1975 | 11.97 | 6.48 |
| NO 4 1953 | 20.93 | 15.44 |
| C 72 1965 | 14.72 | 9.23 |

850130681

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, MW-10S
AUGUST 29 THROUGH SEPTEMBER6, 1991

| <u>DATE</u> | <u>TIME</u> | <u>CORRECTED</u> | | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|-----------------------------|---------------------------------------|---------------------------------|
| | | <u>TELOG
HEAD</u> | <u>DTW
STEEL CASING</u> | | |
| 08/29/90 | 15:45:07 | 5.86 | 3.98 | 8.17 | 0 |
| 08/29/90 | 17:45:07 | 5.88 | 3.96 | 8.19 | 2 |
| 08/29/90 | 19:45:07 | 5.89 | 3.95 | 8.20 | 4 |
| 08/29/90 | 21:45:07 | 5.88 | 3.96 | 8.19 | 6 |
| 08/29/90 | 23:45:07 | 5.88 | 3.96 | 8.19 | 8 |
| 08/30/90 | 01:45:07 | 5.90 | 3.94 | 8.21 | 10 |
| 08/30/90 | 03:45:07 | 5.90 | 3.94 | 8.21 | 12 |
| 08/30/90 | 05:45:07 | 5.89 | 3.95 | 8.20 | 14 |
| 08/30/90 | 07:45:07 | 5.86 | 3.98 | 8.17 | 16 |
| 08/30/90 | 09:45:07 | 5.85 | 3.99 | 8.16 | 18 |
| 08/30/90 | 11:45:07 | 5.85 | 3.99 | 8.16 | 20 |
| 08/30/90 | 13:45:07 | 5.85 | 3.99 | 8.16 | 22 |
| 08/30/90 | 15:45:07 | 5.86 | 3.98 | 8.17 | 24 |
| 08/30/90 | 17:45:07 | 5.87 | 3.97 | 8.18 | 26 |
| 08/30/90 | 19:45:07 | 5.86 | 3.98 | 8.17 | 28 |
| 08/30/90 | 21:45:07 | 5.86 | 3.98 | 8.17 | 30 |
| 08/30/90 | 23:45:07 | 5.84 | 4.00 | 8.15 | 32 |
| 08/31/90 | 01:45:07 | 5.84 | 4.00 | 8.15 | 34 |
| 08/31/90 | 03:45:07 | 5.84 | 4.00 | 8.15 | 36 |
| 08/31/90 | 05:45:07 | 5.83 | 4.01 | 8.14 | 38 |
| 08/31/90 | 07:45:07 | 5.82 | 4.02 | 8.13 | 40 |
| 08/31/90 | 09:45:07 | 5.80 | 4.04 | 8.11 | 42 |
| 08/31/90 | 11:45:07 | 5.79 | 4.05 | 8.10 | 44 |
| 08/31/90 | 13:45:07 | 5.80 | 4.04 | 8.11 | 46 |
| 08/31/90 | 15:45:07 | 5.80 | 4.04 | 8.11 | 48 |
| 08/31/90 | 17:45:07 | 5.82 | 4.02 | 8.13 | 50 |
| 08/31/90 | 19:45:07 | 5.81 | 4.03 | 8.12 | 52 |
| 08/31/90 | 21:45:07 | 5.81 | 4.03 | 8.12 | 54 |
| 08/31/90 | 23:45:07 | 5.80 | 4.04 | 8.11 | 56 |
| 09/01/90 | 01:45:07 | 5.79 | 4.05 | 8.10 | 58 |
| 09/01/90 | 03:45:07 | 5.79 | 4.05 | 8.10 | 60 |
| 09/01/90 | 05:45:07 | 5.79 | 4.05 | 8.10 | 62 |
| 09/01/90 | 07:45:07 | 5.77 | 4.07 | 8.08 | 64 |
| 09/01/90 | 09:45:07 | 5.76 | 4.08 | 8.07 | 66 |
| 09/01/90 | 11:45:07 | 5.77 | 4.07 | 8.08 | 68 |
| 09/01/90 | 13:45:07 | 5.78 | 4.06 | 8.09 | 70 |
| 09/01/90 | 15:45:07 | 5.77 | 4.07 | 8.08 | 72 |
| 09/01/90 | 17:45:07 | 5.78 | 4.06 | 8.09 | 74 |
| 09/01/90 | 19:45:07 | 5.77 | 4.07 | 8.08 | 76 |

850130682

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, MW-10S
AUGUST 29 THROUGH SEPTEMBER6, 1991

| <u>DATE</u> | <u>TIME</u> | <u>CORRECTED</u> | | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|-----------------------------|---------------------------------------|---------------------------------|
| | | <u>TELOG
HEAD</u> | <u>DTW
STEEL CASING</u> | | |
| 09/01/90 | 21:45:07 | 5.77 | 4.07 | 8.08 | 78 |
| 09/01/90 | 23:45:07 | 5.77 | 4.07 | 8.08 | 80 |
| 09/02/90 | 01:45:07 | 5.77 | 4.07 | 8.08 | 82 |
| 09/02/90 | 03:45:07 | 5.77 | 4.07 | 8.08 | 84 |
| 09/02/90 | 05:45:07 | 5.76 | 4.08 | 8.07 | 86 |
| 09/02/90 | 07:45:07 | 5.75 | 4.09 | 8.06 | 88 |
| 09/02/90 | 09:45:07 | 5.72 | 4.12 | 8.03 | 90 |
| 09/02/90 | 11:45:07 | 5.72 | 4.12 | 8.03 | 92 |
| 09/02/90 | 13:45:07 | 5.73 | 4.11 | 8.04 | 94 |
| 09/02/90 | 15:45:07 | 5.74 | 4.10 | 8.05 | 96 |
| 09/02/90 | 17:45:07 | 5.74 | 4.10 | 8.05 | 98 |
| 09/02/90 | 19:45:07 | 5.74 | 4.10 | 8.05 | 100 |
| 09/02/90 | 21:45:07 | 5.73 | 4.11 | 8.04 | 102 |
| 09/02/90 | 23:45:07 | 5.72 | 4.12 | 8.03 | 104 |
| 09/03/90 | 01:45:07 | 5.72 | 4.12 | 8.03 | 106 |
| 09/03/90 | 03:45:07 | 5.72 | 4.12 | 8.03 | 108 |
| 09/03/90 | 05:45:07 | 5.71 | 4.13 | 8.02 | 110 |
| 09/03/90 | 07:45:07 | 5.70 | 4.14 | 8.01 | 112 |
| 09/03/90 | 09:45:07 | 5.68 | 4.16 | 7.99 | 114 |
| 09/03/90 | 11:45:07 | 5.68 | 4.16 | 7.99 | 116 |
| 09/03/90 | 13:45:07 | 5.80 | 4.04 | 8.11 | 118 |
| 09/03/90 | 15:45:07 | 6.24 | 3.60 | 8.55 | 120 |
| 09/03/90 | 17:45:07 | 6.31 | 3.53 | 8.62 | 122 |
| 09/03/90 | 19:45:07 | 6.30 | 3.54 | 8.61 | 124 |
| 09/03/90 | 21:45:07 | 6.30 | 3.54 | 8.61 | 126 |
| 09/03/90 | 23:45:07 | 6.30 | 3.54 | 8.61 | 128 |
| 09/04/90 | 01:45:07 | 6.30 | 3.54 | 8.61 | 130 |
| 09/04/90 | 03:45:07 | 6.30 | 3.54 | 8.61 | 132 |
| 09/04/90 | 05:45:07 | 6.29 | 3.55 | 8.60 | 134 |
| 09/04/90 | 07:45:07 | 6.27 | 3.57 | 8.58 | 136 |
| 09/04/90 | 09:45:07 | 6.28 | 3.56 | 8.59 | 138 |
| 09/04/90 | 11:45:07 | 6.31 | 3.53 | 8.62 | 140 |
| 09/04/90 | 13:45:07 | 6.34 | 3.50 | 8.65 | 142 |
| 09/04/90 | 15:45:07 | 6.40 | 3.44 | 8.71 | 144 |
| 09/04/90 | 17:45:07 | 6.43 | 3.41 | 8.74 | 146 |
| 09/04/90 | 19:45:07 | 6.44 | 3.40 | 8.75 | 148 |
| 09/04/90 | 21:45:07 | 6.44 | 3.40 | 8.75 | 150 |
| 09/04/90 | 23:45:07 | 6.44 | 3.40 | 8.75 | 152 |
| 09/05/90 | 01:45:07 | 6.44 | 3.40 | 8.75 | 154 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 UPPER WATER-BEARING ZONE, MW-10S
 AUGUST 29 THROUGH SEPTEMBER 6, 1991

| <u>DATE</u> | <u>TIME</u> | TELOG
<u>HEAD</u> | CORRECTED
DTW
<u>STEEL CASING</u> | WATER-LEVEL
<u>ELEVATION(MSL)</u> | ELAPSED TIME
<u>(HOURS)</u> |
|-------------|-------------|----------------------|-----------------------------------------|--------------------------------------|--------------------------------|
| 09/05/90 | 03:45:07 | 6.43 | 3.41 | 8.74 | 156 |
| 09/05/90 | 05:45:07 | 6.41 | 3.43 | 8.72 | 158 |
| 09/05/90 | 07:45:07 | 6.41 | 3.43 | 8.72 | 160 |
| 09/05/90 | 09:45:07 | 6.41 | 3.43 | 8.72 | 162 |
| 09/05/90 | 11:45:07 | 6.41 | 3.43 | 8.72 | 164 |
| 09/05/90 | 13:45:07 | 6.42 | 3.42 | 8.73 | 166 |
| 09/05/90 | 15:45:07 | 6.41 | 3.43 | 8.72 | 168 |
| 09/05/90 | 17:45:07 | 6.42 | 3.42 | 8.73 | 170 |
| 09/05/90 | 19:45:07 | 6.42 | 3.42 | 8.73 | 172 |
| 09/05/90 | 21:45:07 | 6.41 | 3.43 | 8.72 | 174 |
| 09/05/90 | 23:45:07 | 6.41 | 3.43 | 8.72 | 176 |
| 09/06/90 | 01:45:07 | 6.41 | 3.43 | 8.72 | 178 |
| 09/06/90 | 03:45:07 | 6.41 | 3.43 | 8.72 | 180 |
| 09/06/90 | 05:45:07 | 6.41 | 3.43 | 8.72 | 182 |
| 09/06/90 | 07:45:07 | 6.41 | 3.43 | 8.72 | 184 |
| 09/06/90 | 09:45:07 | 6.40 | 3.44 | 8.71 | 186 |
| 09/06/90 | 11:45:07 | 6.39 | 3.45 | 8.70 | 188 |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-10S, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

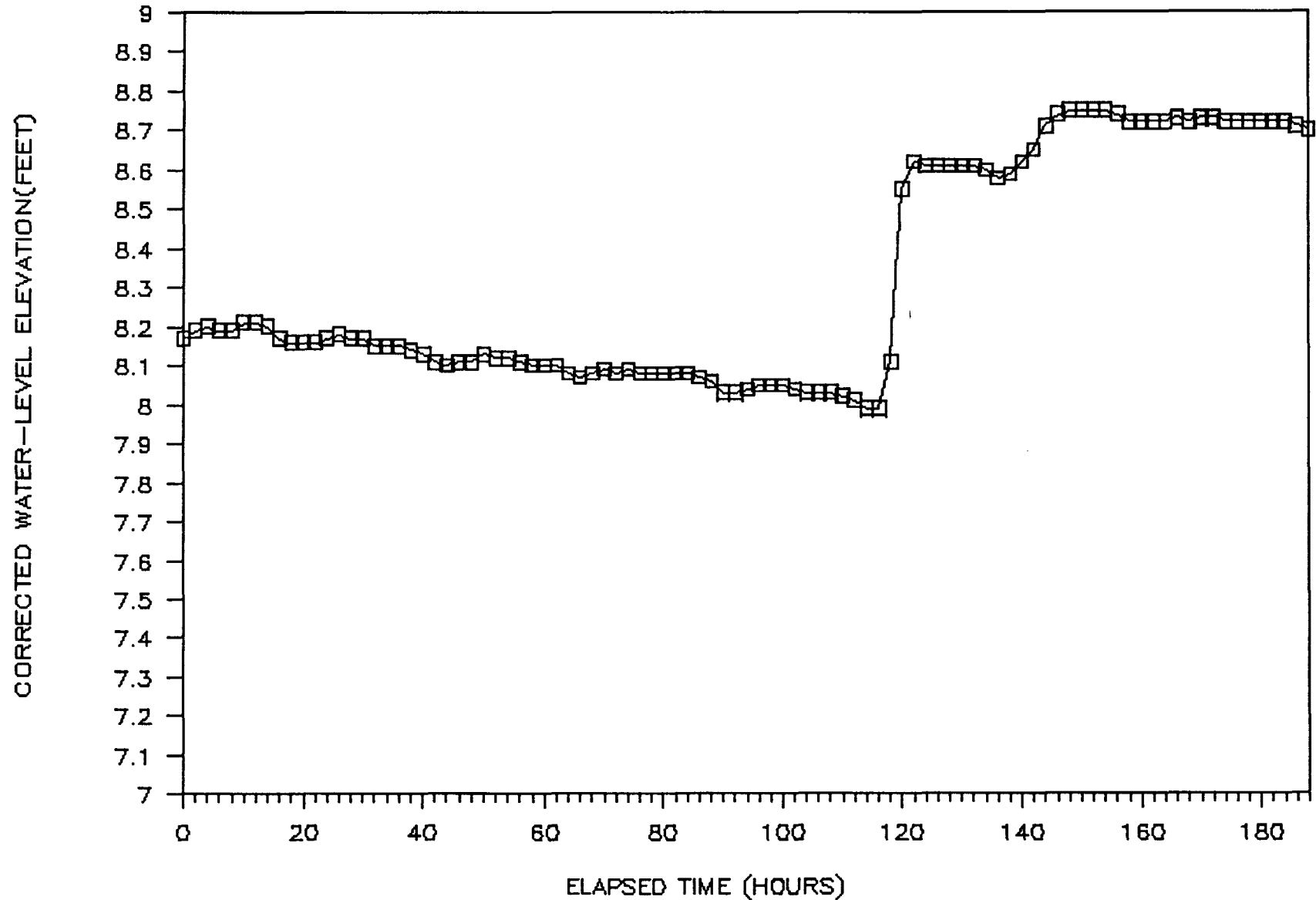
| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:45 | 0 | 8.13 |
| | 19:45 | 2 | 8.12 |
| | 21:45 | 4 | 8.12 |
| | 23:45 | 6 | 8.11 |
| 09/01/91 | 01:45 | 8 | 8.10 |
| | 03:45 | 10 | 8.10 |
| | 05:45 | 12 | 8.10 |
| | 07:45 | 14 | 8.08 |
| | 09:45 | 16 | 8.07 |
| | 11:45 | 18 | 8.08 |
| | 13:45 | 20 | 8.09 |
| | 15:45 | 22 | 8.08 |
| | 17:45 | 24 | 8.09 |
| | 19:45 | 26 | 8.08 |
| | 21:45 | 28 | 8.08 |
| | 23:45 | 30 | 8.08 |
| 09/02/91 | 01:45 | 32 | 8.08 |
| | 03:45 | 34 | 8.08 |
| | 05:45 | 36 | 8.07 |
| | 07:45 | 38 | 8.06 |
| | 09:45 | 40 | 8.03 |
| | 11:45 | 42 | 8.03 |
| | 13:45 | 44 | 8.04 |
| | 15:45 | 46 | 8.05 |
| | 17:45 | 48 | 8.05 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | 8.08 |

* In feet above mean sea level.

¹ No apparent tidal influence.

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

UPPER WATER-BEARING ZONE MW-10S



850130686

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, WELL MW-11S
AUGUST 29 THROUGH 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW(PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|-------------------------------|---------------------------------------|---------------------------------|
| 08/29/90 | 13:35:24 | 5.71 | 2.82 | 8.05 | 0 |
| 08/29/90 | 15:35:24 | 5.70 | 2.83 | 8.04 | 2 |
| 08/29/90 | 17:35:24 | 5.68 | 2.85 | 8.02 | 4 |
| 08/29/90 | 19:35:24 | 5.68 | 2.85 | 8.02 | 6 |
| 08/29/90 | 21:35:24 | 5.67 | 2.86 | 8.01 | 8 |
| 08/29/90 | 23:35:24 | 5.66 | 2.87 | 8.00 | 10 |
| 08/30/90 | 01:35:24 | 5.66 | 2.87 | 8.00 | 12 |
| 08/30/90 | 03:35:24 | 5.65 | 2.88 | 7.99 | 14 |
| 08/30/90 | 05:35:24 | 5.63 | 2.90 | 7.97 | 16 |
| 08/30/90 | 07:35:24 | 5.63 | 2.90 | 7.97 | 18 |
| 08/30/90 | 09:35:24 | 5.62 | 2.91 | 7.96 | 20 |
| 08/30/90 | 11:35:24 | 5.61 | 2.92 | 7.95 | 22 |
| 08/30/90 | 13:35:24 | 5.61 | 2.92 | 7.95 | 24 |
| 08/30/90 | 15:35:24 | 5.60 | 2.93 | 7.94 | 26 |
| 08/30/90 | 17:35:24 | 5.58 | 2.95 | 7.92 | 28 |
| 08/30/90 | 19:35:24 | 5.57 | 2.96 | 7.91 | 30 |
| 08/30/90 | 21:35:24 | 5.57 | 2.96 | 7.91 | 32 |
| 08/30/90 | 23:35:24 | 5.56 | 2.97 | 7.90 | 34 |
| 08/31/90 | 01:35:24 | 5.56 | 2.97 | 7.90 | 36 |
| 08/31/90 | 03:35:24 | 5.54 | 2.99 | 7.88 | 38 |
| 08/31/90 | 05:35:24 | 5.53 | 3.00 | 7.87 | 40 |
| 08/31/90 | 07:35:24 | 5.54 | 2.99 | 7.88 | 42 |
| 08/31/90 | 09:35:24 | 5.54 | 2.99 | 7.88 | 44 |
| 08/31/90 | 11:35:24 | 5.53 | 3.00 | 7.87 | 46 |
| 08/31/90 | 13:35:24 | 5.53 | 3.00 | 7.87 | 48 |
| 08/31/90 | 15:35:24 | 5.52 | 3.01 | 7.86 | 50 |
| 08/31/90 | 17:35:24 | 5.51 | 3.02 | 7.85 | 52 |
| 08/31/90 | 19:35:24 | 5.50 | 3.03 | 7.84 | 54 |
| 08/31/90 | 21:35:24 | 5.49 | 3.04 | 7.83 | 56 |
| 08/31/90 | 23:35:24 | 5.49 | 3.04 | 7.83 | 58 |
| 09/01/90 | 01:35:24 | 5.49 | 3.04 | 7.83 | 60 |
| 09/01/90 | 03:35:24 | 5.48 | 3.05 | 7.82 | 62 |
| 09/01/90 | 05:35:24 | 5.46 | 3.07 | 7.80 | 64 |
| 09/01/90 | 07:35:24 | 5.46 | 3.07 | 7.80 | 66 |
| 09/01/90 | 09:35:24 | 5.46 | 3.07 | 7.80 | 68 |
| 09/01/90 | 11:35:24 | 5.47 | 3.06 | 7.81 | 70 |
| 09/01/90 | 13:35:24 | 5.46 | 3.07 | 7.80 | 72 |
| 09/01/90 | 15:35:24 | 5.46 | 3.07 | 7.80 | 74 |
| 09/01/90 | 17:35:24 | 5.45 | 3.08 | 7.79 | 76 |
| 09/01/90 | 19:35:24 | 5.44 | 3.09 | 7.78 | 78 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, WELL MW-11S
AUGUST 29 THROUGH 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW(PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|-------------------------------|---------------------------------------|---------------------------------|
| 09/01/90 | 21:35:24 | 5.44 | 3.09 | 7.78 | 80 |
| 09/01/90 | 23:35:24 | 5.44 | 3.09 | 7.78 | 82 |
| 09/02/90 | 01:35:24 | 5.44 | 3.09 | 7.78 | 84 |
| 09/02/90 | 03:35:24 | 5.44 | 3.09 | 7.78 | 86 |
| 09/02/90 | 05:35:24 | 5.43 | 3.10 | 7.77 | 88 |
| 09/02/90 | 07:35:24 | 5.42 | 3.11 | 7.76 | 90 |
| 09/02/90 | 09:35:24 | 5.43 | 3.10 | 7.77 | 92 |
| 09/02/90 | 11:35:24 | 5.42 | 3.11 | 7.76 | 94 |
| 09/02/90 | 13:35:24 | 5.42 | 3.11 | 7.76 | 96 |
| 09/02/90 | 15:35:24 | 5.42 | 3.11 | 7.76 | 98 |
| 09/02/90 | 17:35:24 | 5.42 | 3.11 | 7.76 | 100 |
| 09/02/90 | 19:35:24 | 5.41 | 3.12 | 7.75 | 102 |
| 09/02/90 | 21:35:24 | 5.40 | 3.13 | 7.74 | 104 |
| 09/02/90 | 23:35:24 | 5.40 | 3.13 | 7.74 | 106 |
| 09/03/90 | 01:35:24 | 5.39 | 3.14 | 7.73 | 108 |
| 09/03/90 | 03:35:24 | 5.38 | 3.15 | 7.72 | 110 |
| 09/03/90 | 05:35:24 | 5.37 | 3.16 | 7.71 | 112 |
| 09/03/90 | 07:35:24 | 5.36 | 3.17 | 7.70 | 114 |
| 09/03/90 | 09:35:24 | 5.35 | 3.18 | 7.69 | 116 |
| 09/03/90 | 11:35:24 | 5.35 | 3.18 | 7.69 | 118 |
| 09/03/90 | 13:35:24 | 5.35 | 3.18 | 7.69 | 120 |
| 09/03/90 | 15:35:24 | 5.34 | 3.19 | 7.68 | 122 |
| 09/03/90 | 17:35:24 | 5.33 | 3.20 | 7.67 | 124 |
| 09/03/90 | 19:35:24 | 5.32 | 3.21 | 7.66 | 126 |
| 09/03/90 | 21:35:24 | 5.32 | 3.21 | 7.66 | 128 |
| 09/03/90 | 23:35:24 | 5.32 | 3.21 | 7.66 | 130 |
| 09/04/90 | 01:35:24 | 5.32 | 3.21 | 7.66 | 132 |
| 09/04/90 | 03:35:24 | 5.31 | 3.22 | 7.65 | 134 |
| 09/04/90 | 05:35:24 | 5.31 | 3.22 | 7.65 | 136 |
| 09/04/90 | 07:35:24 | 5.32 | 3.21 | 7.66 | 138 |
| 09/04/90 | 09:35:24 | 5.32 | 3.21 | 7.66 | 140 |
| 09/04/90 | 11:35:24 | 5.32 | 3.21 | 7.66 | 142 |
| 09/04/90 | 13:35:24 | 5.32 | 3.21 | 7.66 | 144 |
| 09/04/90 | 15:35:24 | 5.33 | 3.20 | 7.67 | 146 |
| 09/04/90 | 17:35:24 | 5.32 | 3.21 | 7.66 | 148 |
| 09/04/90 | 19:35:24 | 5.31 | 3.22 | 7.65 | 150 |
| 09/04/90 | 21:35:24 | 5.31 | 3.22 | 7.65 | 152 |
| 09/04/90 | 23:35:24 | 5.32 | 3.21 | 7.66 | 154 |
| 09/05/90 | 01:35:24 | 5.32 | 3.21 | 7.66 | 156 |
| 09/05/90 | 03:35:24 | 5.31 | 3.22 | 7.65 | 158 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 UPPER WATER-BEARING ZONE, WELL MW-11S
 AUGUST 29 THROUGH 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW(PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|-------------------------------|---------------------------------------|---------------------------------|
| 09/05/90 | 05:35:24 | 5.31 | 3.22 | 7.65 | 160 |
| 09/05/90 | 07:35:24 | 5.31 | 3.22 | 7.65 | 162 |
| 09/05/90 | 09:35:24 | 5.31 | 3.22 | 7.65 | 164 |
| 09/05/90 | 11:35:24 | 5.32 | 3.21 | 7.66 | 166 |
| 09/05/90 | 13:35:24 | 5.31 | 3.22 | 7.65 | 168 |
| 09/05/90 | 15:35:24 | 5.31 | 3.22 | 7.65 | 170 |
| 09/05/90 | 17:35:24 | 5.30 | 3.23 | 7.64 | 172 |
| 09/05/90 | 19:35:24 | 5.29 | 3.24 | 7.63 | 174 |
| 09/05/90 | 21:35:24 | 5.30 | 3.23 | 7.64 | 176 |
| 09/05/90 | 23:35:24 | 5.30 | 3.23 | 7.64 | 178 |
| 09/06/90 | 01:35:24 | 5.30 | 3.23 | 7.64 | 180 |
| 09/06/90 | 03:35:24 | 5.29 | 3.24 | 7.63 | 182 |
| 09/06/90 | 05:35:24 | 5.28 | 3.25 | 7.62 | 184 |
| 09/06/90 | 07:35:24 | 5.28 | 3.25 | 7.62 | 186 |
| 09/06/90 | 09:35:24 | 5.28 | 3.25 | 7.62 | 188 |
| 09/06/90 | 11:35:24 | 5.29 | 3.24 | 7.63 | 190 |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-11S, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:35 | 0 | 7.85 |
| | 19:35 | 2 | 7.84 |
| | 21:35 | 4 | 7.83 |
| | 23:35 | 6 | 7.83 |
| 09/01/91 | 01:35 | 8 | 7.83 |
| | 03:35 | 10 | 7.82 |
| | 05:35 | 12 | 7.80 |
| | 07:35 | 14 | 7.80 |
| | 09:35 | 16 | 7.80 |
| | 11:35 | 18 | 7.81 |
| | 13:35 | 20 | 7.80 |
| | 15:35 | 22 | 7.80 |
| | 17:35 | 24 | 7.79 |
| | 19:35 | 26 | 7.78 |
| | 21:35 | 28 | 7.78 |
| | 23:35 | 30 | 7.78 |
| 09/02/91 | 01:35 | 32 | 7.78 |
| | 03:35 | 34 | 7.78 |
| | 05:35 | 36 | 7.77 |
| | 07:35 | 38 | 7.76 |
| | 09:35 | 40 | 7.77 |
| | 11:35 | 42 | 7.76 |
| | 13:35 | 44 | 7.76 |
| | 15:35 | 46 | 7.76 |
| | 17:35 | 48 | 7.76 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | 7.79 |

* In feet above mean sea level.

¹ No apparent tidal influence.

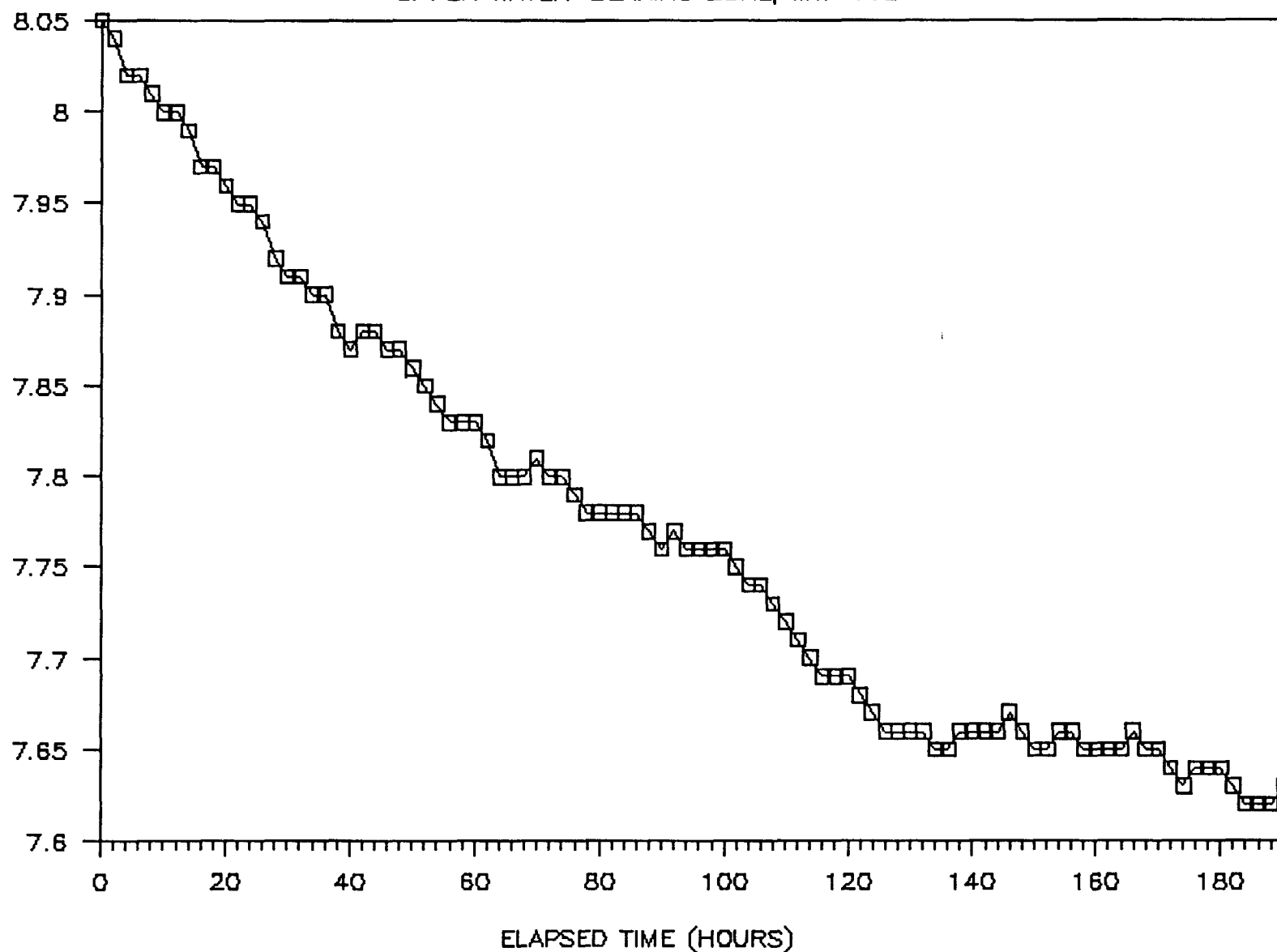
850130690

MO06606J.11.10 7.91

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

UPPER WATER-BEARING ZONE, MW-11S

CORRECTED WATER-LEVEL ELEVATION (FEET)



ELAPSED TIME (HOURS)

850130691

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, WELL MW-13S
AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | TELOG
<u>HEAD</u> | CORRECTED
DTW
<u>(STEEL CASING)</u> | WATER-LEVEL
<u>ELEVATION(MSL)</u> | ELAPSED TIME
<u>(HOURS)</u> |
|-------------|-------------|----------------------|-------------------------------------------|--------------------------------------|--------------------------------|
| 08/29/90 | 13:51:24 | 4.38 | 4.40 | 6.70 | 0 |
| 08/29/90 | 15:51:24 | 4.41 | 4.37 | 6.73 | 2 |
| 08/29/90 | 17:51:24 | 4.43 | 4.35 | 6.75 | 4 |
| 08/29/90 | 19:51:24 | 4.40 | 4.38 | 6.72 | 6 |
| 08/29/90 | 21:51:24 | 4.37 | 4.41 | 6.69 | 8 |
| 08/29/90 | 23:51:24 | 4.36 | 4.42 | 6.68 | 10 |
| 08/30/90 | 01:51:24 | 4.36 | 4.42 | 6.68 | 12 |
| 08/30/90 | 03:51:24 | 4.36 | 4.42 | 6.68 | 14 |
| 08/30/90 | 05:51:24 | 4.36 | 4.42 | 6.68 | 16 |
| 08/30/90 | 07:51:24 | 4.34 | 4.44 | 6.66 | 18 |
| 08/30/90 | 09:51:24 | 4.34 | 4.44 | 6.66 | 20 |
| 08/30/90 | 11:51:24 | 4.31 | 4.47 | 6.63 | 22 |
| 08/30/90 | 13:51:24 | 4.32 | 4.46 | 6.64 | 24 |
| 08/30/90 | 15:51:24 | 4.35 | 4.43 | 6.67 | 26 |
| 08/30/90 | 17:51:24 | 4.37 | 4.41 | 6.69 | 28 |
| 08/30/90 | 19:51:24 | 4.36 | 4.42 | 6.68 | 30 |
| 08/30/90 | 21:51:24 | 4.33 | 4.45 | 6.65 | 32 |
| 08/30/90 | 23:51:24 | 4.31 | 4.47 | 6.63 | 34 |
| 08/31/90 | 01:51:24 | 4.30 | 4.48 | 6.62 | 36 |
| 08/31/90 | 03:51:24 | 4.30 | 4.48 | 6.62 | 38 |
| 08/31/90 | 05:51:24 | 4.30 | 4.48 | 6.62 | 40 |
| 08/31/90 | 07:51:24 | 4.27 | 4.51 | 6.59 | 42 |
| 08/31/90 | 09:51:24 | 4.27 | 4.51 | 6.59 | 44 |
| 08/31/90 | 11:51:24 | 4.26 | 4.52 | 6.58 | 46 |
| 08/31/90 | 13:51:24 | 4.25 | 4.53 | 6.57 | 48 |
| 08/31/90 | 15:51:24 | 4.27 | 4.51 | 6.59 | 50 |
| 08/31/90 | 17:51:24 | 4.30 | 4.48 | 6.62 | 52 |
| 08/31/90 | 19:51:24 | 4.30 | 4.48 | 6.62 | 54 |
| 08/31/90 | 21:51:24 | 4.28 | 4.50 | 6.60 | 56 |
| 08/31/90 | 23:51:24 | 4.25 | 4.53 | 6.57 | 58 |
| 09/01/90 | 01:51:24 | 4.24 | 4.54 | 6.56 | 60 |
| 09/01/90 | 03:51:24 | 4.23 | 4.55 | 6.55 | 62 |
| 09/01/90 | 05:51:24 | 4.24 | 4.54 | 6.56 | 64 |
| 09/01/90 | 07:51:24 | 4.21 | 4.57 | 6.53 | 66 |
| 09/01/90 | 09:51:24 | 4.21 | 4.57 | 6.53 | 68 |
| 09/01/90 | 11:51:24 | 4.21 | 4.57 | 6.53 | 70 |
| 09/01/90 | 13:51:24 | 4.20 | 4.58 | 6.52 | 72 |
| 09/01/90 | 15:51:24 | 4.21 | 4.57 | 6.53 | 74 |
| 09/01/90 | 17:51:24 | 4.25 | 4.53 | 6.57 | 76 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
UPPER WATER-BEARING ZONE, WELL MW-13S
AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | TELOG
<u>HEAD</u> | CORRECTED | | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|----------------------|------------------------------|--|---------------------------------------|---------------------------------|
| | | | DTW
<u>(STEEL CASING)</u> | | | |
| 09/01/90 | 19:51:24 | 4.26 | 4.52 | | 6.58 | 78 |
| 09/01/90 | 21:51:24 | 4.24 | 4.54 | | 6.56 | 80 |
| 09/01/90 | 23:51:24 | 4.23 | 4.55 | | 6.55 | 82 |
| 09/02/90 | 01:51:24 | 4.20 | 4.58 | | 6.52 | 84 |
| 09/02/90 | 03:51:24 | 4.20 | 4.58 | | 6.52 | 86 |
| 09/02/90 | 05:51:24 | 4.20 | 4.58 | | 6.52 | 88 |
| 09/02/90 | 07:51:24 | 4.20 | 4.58 | | 6.52 | 90 |
| 09/02/90 | 09:51:24 | 4.20 | 4.58 | | 6.52 | 92 |
| 09/02/90 | 11:51:24 | 4.19 | 4.59 | | 6.51 | 94 |
| 09/02/90 | 13:51:24 | 4.19 | 4.59 | | 6.51 | 96 |
| 09/02/90 | 15:51:24 | 4.19 | 4.59 | | 6.51 | 98 |
| 09/02/90 | 17:51:24 | 4.22 | 4.56 | | 6.54 | 100 |
| 09/02/90 | 19:51:24 | 4.22 | 4.56 | | 6.54 | 102 |
| 09/02/90 | 21:51:24 | 4.22 | 4.56 | | 6.54 | 104 |
| 09/02/90 | 23:51:24 | 4.21 | 4.57 | | 6.53 | 106 |
| 09/03/90 | 01:51:24 | 4.18 | 4.60 | | 6.50 | 108 |
| 09/03/90 | 03:51:24 | 4.16 | 4.62 | | 6.48 | 110 |
| 09/03/90 | 05:51:24 | 4.15 | 4.63 | | 6.47 | 112 |
| 09/03/90 | 07:51:24 | 4.15 | 4.63 | | 6.47 | 114 |
| 09/03/90 | 09:51:24 | 4.15 | 4.63 | | 6.47 | 116 |
| 09/03/90 | 11:51:24 | 4.15 | 4.63 | | 6.47 | 118 |
| 09/03/90 | 13:51:24 | 4.13 | 4.65 | | 6.45 | 120 |
| 09/03/90 | 15:51:24 | 4.13 | 4.65 | | 6.45 | 122 |
| 09/03/90 | 17:51:24 | 4.14 | 4.64 | | 6.46 | 124 |
| 09/03/90 | 19:51:24 | 4.15 | 4.63 | | 6.47 | 126 |
| 09/03/90 | 21:51:24 | 4.16 | 4.62 | | 6.48 | 128 |
| 09/03/90 | 23:51:24 | 4.16 | 4.62 | | 6.48 | 130 |
| 09/04/90 | 01:51:24 | 4.14 | 4.64 | | 6.46 | 132 |
| 09/04/90 | 03:51:24 | 4.12 | 4.66 | | 6.44 | 134 |
| 09/04/90 | 05:51:24 | 4.10 | 4.68 | | 6.42 | 136 |
| 09/04/90 | 07:51:24 | 4.11 | 4.67 | | 6.43 | 138 |
| 09/04/90 | 09:51:24 | 4.13 | 4.65 | | 6.45 | 140 |
| 09/04/90 | 11:51:24 | 4.14 | 4.64 | | 6.46 | 142 |
| 09/04/90 | 13:51:24 | 4.13 | 4.65 | | 6.45 | 144 |
| 09/04/90 | 15:51:24 | 4.11 | 4.67 | | 6.43 | 146 |
| 09/04/90 | 17:51:24 | 4.13 | 4.65 | | 6.45 | 148 |
| 09/04/90 | 19:51:24 | 4.14 | 4.64 | | 6.46 | 150 |
| 09/04/90 | 21:51:24 | 4.17 | 4.61 | | 6.49 | 152 |
| 09/04/90 | 23:51:24 | 4.18 | 4.60 | | 6.50 | 154 |

850130693

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 UPPER WATER-BEARING ZONE, WELL MW-13S
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | TELOG
<u>HEAD</u> | CORRECTED
DTW
<u>(STEEL CASING)</u> | WATER-LEVEL
<u>ELEVATION(MSL)</u> | ELAPSED TIME
<u>(HOURS)</u> |
|-------------|-------------|----------------------|-------------------------------------------|--------------------------------------|--------------------------------|
| 09/05/90 | 01:51:24 | 4.15 | 4.63 | 6.47 | 156 |
| 09/05/90 | 03:51:24 | 4.12 | 4.66 | 6.44 | 158 |
| 09/05/90 | 05:51:24 | 4.11 | 4.67 | 6.43 | 160 |
| 09/05/90 | 07:51:24 | 4.10 | 4.68 | 6.42 | 162 |
| 09/05/90 | 09:51:24 | 4.12 | 4.66 | 6.44 | 164 |
| 09/05/90 | 11:51:24 | 4.16 | 4.62 | 6.48 | 166 |
| 09/05/90 | 13:51:24 | 4.17 | 4.61 | 6.49 | 168 |
| 09/05/90 | 15:51:24 | 4.16 | 4.62 | 6.48 | 170 |
| 09/05/90 | 17:51:24 | 4.17 | 4.61 | 6.49 | 172 |
| 09/05/90 | 19:51:24 | 4.18 | 4.60 | 6.50 | 174 |
| 09/05/90 | 21:51:24 | 4.19 | 4.59 | 6.51 | 176 |
| 09/05/90 | 23:51:24 | 4.20 | 4.58 | 6.52 | 178 |
| 09/06/90 | 01:51:24 | 4.19 | 4.59 | 6.51 | 180 |
| 09/06/90 | 03:51:24 | 4.16 | 4.62 | 6.48 | 182 |
| 09/06/90 | 05:51:24 | 4.14 | 4.64 | 6.46 | 184 |
| 09/06/90 | 07:51:24 | 4.13 | 4.65 | 6.45 | 186 |
| 09/06/90 | 09:51:24 | 4.17 | 4.61 | 6.49 | 188 |
| 09/06/90 | 11:51:24 | 4.17 | 4.61 | 6.49 | 190 |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-13S, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:51 | 0 | 6.62 |
| | 19:51 | 2 | 6.62 |
| | 21:51 | 4 | 6.60 |
| | 23:51 | 6 | 6.57 |
| 09/01/91 | 01:51 | 8 | 6.56 |
| | 03:51 | 10 | 6.55 |
| | 05:51 | 12 | 6.56 |
| | 07:51 | 14 | 6.53 |
| | 09:51 | 16 | 6.53 |
| | 11:51 | 18 | 6.53 |
| | 13:51 | 20 | 6.52 |
| | 15:51 | 22 | 6.53 |
| | 17:51 | 24 | 6.57 |
| | 19:51 | 26 | 6.58 |
| | 21:51 | 28 | 6.56 |
| | 23:51 | 30 | 6.55 |
| 09/02/91 | 01:51 | 32 | 6.52 |
| | 03:51 | 34 | 6.52 |
| | 05:51 | 36 | 6.52 |
| | 07:51 | 38 | 6.52 |
| | 09:51 | 40 | 6.52 |
| | 11:51 | 42 | 6.51 |
| | 13:51 | 44 | 6.51 |
| | 15:51 | 46 | 6.51 |
| | 17:51 | 48 | 6.54 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | 6.55 |

* In feet above mean sea level.

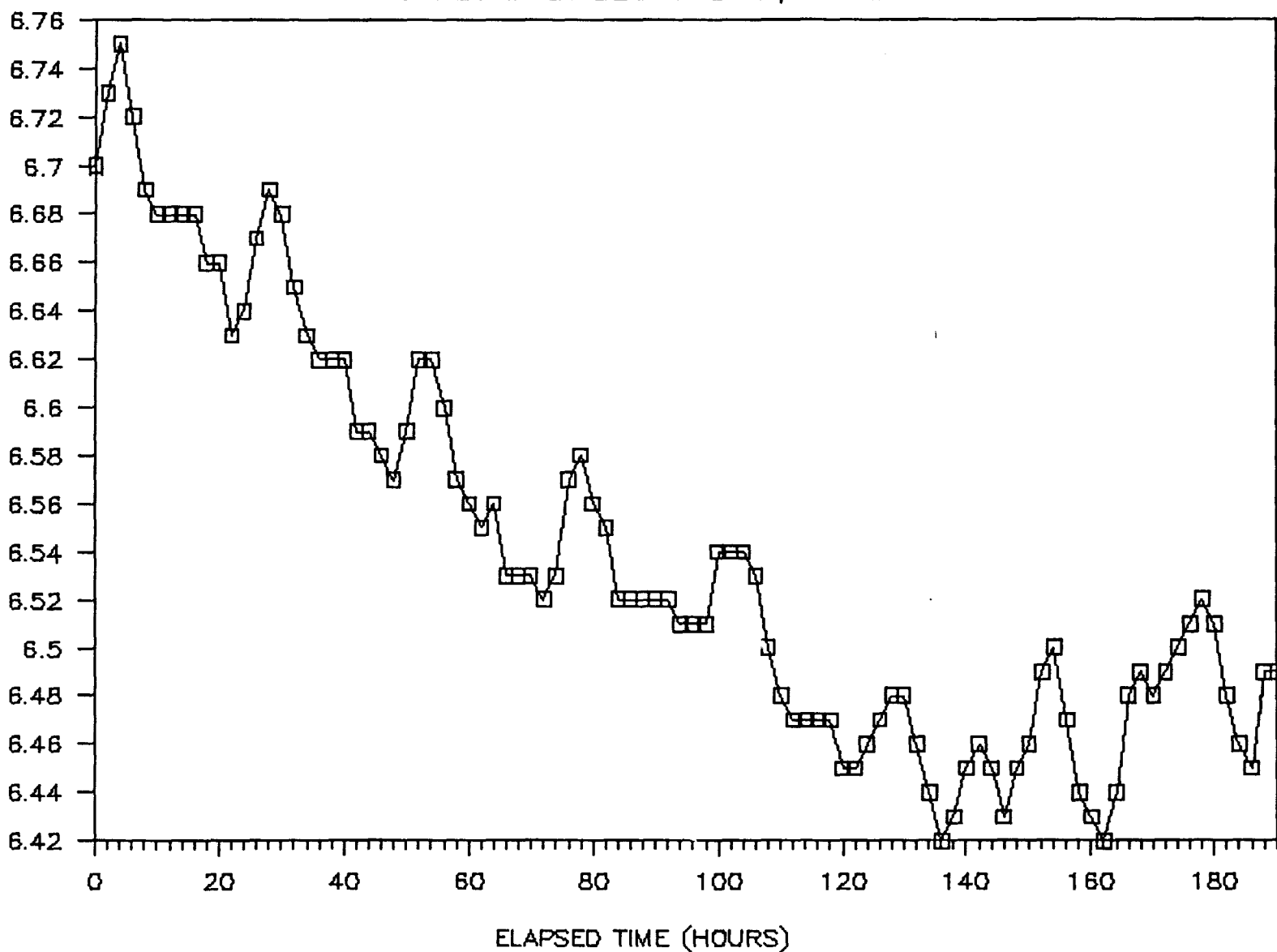
¹ No apparent tidal influence.

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

UPPER WATER-BEARING ZONE, MW13S

CORRECTED WATER-LEVEL ELEVATION (FEET)

850130696



MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-10D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|--------------------------------|----------------------------------------|---------------------------------|
| 08/29/90 | 15:42:56 | 6.55 | 8.94 | 2.64 | 0 |
| 08/29/90 | 17:42:56 | 6.57 | 8.92 | 2.66 | 2 |
| 08/29/90 | 19:42:56 | 6.54 | 8.95 | 2.63 | 4 |
| 08/29/90 | 21:42:56 | 6.49 | 9.00 | 2.58 | 6 |
| 08/29/90 | 23:42:56 | 6.45 | 9.04 | 2.54 | 8 |
| 08/30/90 | 01:42:56 | 6.46 | 9.03 | 2.55 | 10 |
| 08/30/90 | 03:42:56 | 6.47 | 9.02 | 2.56 | 12 |
| 08/30/90 | 05:42:56 | 6.45 | 9.04 | 2.54 | 14 |
| 08/30/90 | 07:42:56 | 6.41 | 9.08 | 2.50 | 16 |
| 08/30/90 | 09:42:56 | 6.36 | 9.13 | 2.45 | 18 |
| 08/30/90 | 11:42:56 | 6.36 | 9.13 | 2.45 | 20 |
| 08/30/90 | 13:42:56 | 6.38 | 9.11 | 2.47 | 22 |
| 08/30/90 | 15:42:56 | 6.41 | 9.08 | 2.50 | 24 |
| 08/30/90 | 17:42:56 | 6.43 | 9.06 | 2.52 | 26 |
| 08/30/90 | 19:42:56 | 6.42 | 9.07 | 2.51 | 28 |
| 08/30/90 | 21:42:56 | 6.39 | 9.10 | 2.48 | 30 |
| 08/30/90 | 23:42:56 | 6.37 | 9.12 | 2.46 | 32 |
| 08/31/90 | 01:42:56 | 6.35 | 9.14 | 2.44 | 34 |
| 08/31/90 | 03:42:56 | 6.36 | 9.13 | 2.45 | 36 |
| 08/31/90 | 05:42:56 | 6.35 | 9.14 | 2.44 | 38 |
| 08/31/90 | 07:42:56 | 6.32 | 9.17 | 2.41 | 40 |
| 08/31/90 | 09:42:56 | 6.30 | 9.19 | 2.39 | 42 |
| 08/31/90 | 11:42:56 | 6.29 | 9.20 | 2.38 | 44 |
| 08/31/90 | 13:42:56 | 6.30 | 9.19 | 2.39 | 46 |
| 08/31/90 | 15:42:56 | 6.34 | 9.15 | 2.43 | 48 |
| 08/31/90 | 17:42:56 | 6.38 | 9.11 | 2.47 | 50 |
| 08/31/90 | 19:42:56 | 6.37 | 9.12 | 2.46 | 52 |
| 08/31/90 | 21:42:56 | 6.36 | 9.13 | 2.45 | 54 |
| 08/31/90 | 23:42:56 | 6.33 | 9.16 | 2.42 | 56 |
| 09/01/90 | 01:42:56 | 6.30 | 9.19 | 2.39 | 58 |
| 09/01/90 | 03:42:56 | 6.30 | 9.19 | 2.39 | 60 |
| 09/01/90 | 05:42:56 | 6.31 | 9.18 | 2.40 | 62 |
| 09/01/90 | 07:42:56 | 6.29 | 9.20 | 2.38 | 64 |
| 09/01/90 | 09:42:56 | 6.28 | 9.21 | 2.37 | 66 |
| 09/01/90 | 11:42:56 | 6.29 | 9.20 | 2.38 | 68 |
| 09/01/90 | 13:42:56 | 6.30 | 9.19 | 2.39 | 70 |
| 09/01/90 | 15:42:56 | 6.32 | 9.17 | 2.41 | 72 |
| 09/01/90 | 17:42:56 | 6.37 | 9.12 | 2.46 | 74 |
| 09/01/90 | 19:42:56 | 6.38 | 9.11 | 2.47 | 76 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-10D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|--------------------------------|----------------------------------------|---------------------------------|
| 09/01/90 | 21:42:56 | 6.39 | 9.10 | 2.48 | 78 |
| 09/01/90 | 23:42:56 | 6.36 | 9.13 | 2.45 | 80 |
| 09/02/90 | 01:42:56 | 6.33 | 9.16 | 2.42 | 82 |
| 09/02/90 | 03:42:56 | 6.33 | 9.16 | 2.42 | 84 |
| 09/02/90 | 05:42:56 | 6.34 | 9.15 | 2.43 | 86 |
| 09/02/90 | 07:42:56 | 6.35 | 9.14 | 2.44 | 88 |
| 09/02/90 | 09:42:56 | 6.35 | 9.14 | 2.44 | 90 |
| 09/02/90 | 11:42:56 | 6.35 | 9.14 | 2.44 | 92 |
| 09/02/90 | 13:42:56 | 6.33 | 9.16 | 2.42 | 94 |
| 09/02/90 | 15:42:56 | 6.33 | 9.16 | 2.42 | 96 |
| 09/02/90 | 17:42:56 | 6.35 | 9.14 | 2.44 | 98 |
| 09/02/90 | 19:42:56 | 6.36 | 9.13 | 2.45 | 100 |
| 09/02/90 | 21:42:56 | 6.35 | 9.14 | 2.44 | 102 |
| 09/02/90 | 23:42:56 | 6.34 | 9.15 | 2.43 | 104 |
| 09/03/90 | 01:42:56 | 6.28 | 9.21 | 2.37 | 106 |
| 09/03/90 | 03:42:56 | 6.23 | 9.26 | 2.32 | 108 |
| 09/03/90 | 05:42:56 | 6.21 | 9.28 | 2.30 | 110 |
| 09/03/90 | 07:42:56 | 6.20 | 9.29 | 2.29 | 112 |
| 09/03/90 | 09:42:56 | 6.19 | 9.30 | 2.28 | 114 |
| 09/03/90 | 11:42:56 | 6.16 | 9.33 | 2.25 | 116 |
| 09/03/90 | 13:42:56 | 6.13 | 9.36 | 2.22 | 118 |
| 09/03/90 | 15:42:56 | 6.11 | 9.38 | 2.20 | 120 |
| 09/03/90 | 17:42:56 | 6.11 | 9.38 | 2.20 | 122 |
| 09/03/90 | 19:42:56 | 6.14 | 9.35 | 2.23 | 124 |
| 09/03/90 | 21:42:56 | 6.15 | 9.34 | 2.24 | 126 |
| 09/03/90 | 23:42:56 | 6.15 | 9.34 | 2.24 | 128 |
| 09/04/90 | 01:42:56 | 6.14 | 9.35 | 2.23 | 130 |
| 09/04/90 | 03:42:56 | 6.11 | 9.38 | 2.20 | 132 |
| 09/04/90 | 05:42:56 | 6.11 | 9.38 | 2.20 | 134 |
| 09/04/90 | 07:42:56 | 6.11 | 9.38 | 2.20 | 136 |
| 09/04/90 | 09:42:56 | 6.15 | 9.34 | 2.24 | 138 |
| 09/04/90 | 11:42:56 | 6.19 | 9.30 | 2.28 | 140 |
| 09/04/90 | 13:42:56 | 6.21 | 9.28 | 2.30 | 142 |
| 09/04/90 | 15:42:56 | 6.22 | 9.27 | 2.31 | 144 |
| 09/04/90 | 17:42:56 | 6.23 | 9.26 | 2.32 | 146 |
| 09/04/90 | 19:42:56 | 6.26 | 9.23 | 2.35 | 148 |
| 09/04/90 | 21:42:56 | 6.31 | 9.18 | 2.40 | 150 |
| 09/04/90 | 23:42:56 | 6.32 | 9.17 | 2.41 | 152 |
| 09/05/90 | 01:42:56 | 6.32 | 9.17 | 2.41 | 154 |
| 09/05/90 | 03:42:56 | 6.27 | 9.22 | 2.36 | 156 |

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-10D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|--------------------------------|----------------------------------------|---------------------------------|
| 09/05/90 | 05:42:56 | 6.25 | 9.24 | 2.34 | 158 |
| 09/05/90 | 07:42:56 | 6.28 | 9.21 | 2.37 | 160 |
| 09/05/90 | 09:42:56 | 6.32 | 9.17 | 2.41 | 162 |
| 09/05/90 | 11:42:56 | 6.36 | 9.13 | 2.45 | 164 |
| 09/05/90 | 13:42:56 | 6.36 | 9.13 | 2.45 | 166 |
| 09/05/90 | 15:42:56 | 6.30 | 9.19 | 2.39 | 168 |
| 09/05/90 | 17:42:56 | 6.28 | 9.21 | 2.37 | 170 |
| 09/05/90 | 19:42:56 | 6.28 | 9.21 | 2.37 | 172 |
| 09/05/90 | 21:42:56 | 6.31 | 9.18 | 2.40 | 174 |
| 09/05/90 | 23:42:56 | 6.34 | 9.15 | 2.43 | 176 |
| 09/06/90 | 01:42:56 | 6.32 | 9.17 | 2.41 | 178 |
| 09/06/90 | 03:42:56 | 6.27 | 9.22 | 2.36 | 180 |
| 09/06/90 | 05:42:56 | 6.22 | 9.27 | 2.31 | 182 |
| 09/06/90 | 07:42:56 | 6.22 | 9.27 | 2.31 | 184 |
| 09/06/90 | 09:42:56 | 6.26 | 9.23 | 2.35 | 186 |
| 09/06/90 | 11:42:56 | 6.30 | 9.19 | 2.39 | 188 |
| | | | | 11.58 | |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-10D, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:42 | 0 | 2.47 |
| | 19:42 | 2 | 2.46 |
| | 21:42 | 4 | 2.45 |
| | 23:42 | 6 | 2.42 |
| 09/01/91 | 01:42 | 8 | 2.39 |
| | 03:42 | 10 | 2.39 |
| | 05:42 | 12 | 2.40 |
| | 07:42 | 14 | 2.38 |
| | 09:42 | 16 | 2.37 |
| | 11:42 | 18 | 2.38 |
| | 13:42 | 20 | 2.39 |
| | 15:42 | 22 | 2.41 |
| | 17:42 | 24 | 2.46 |
| | 19:42 | 26 | 2.47 |
| | 21:42 | 28 | 2.48 |
| | 23:42 | 30 | 2.45 |
| 09/02/91 | 01:42 | 32 | 2.42 |
| | 03:42 | 34 | 2.42 |
| | 05:42 | 36 | 2.43 |
| | 07:42 | 38 | 2.44 |
| | 09:42 | 40 | 2.44 |
| | 11:42 | 42 | 2.44 |
| | 13:42 | 44 | 2.42 |
| | 15:42 | 46 | 2.42 |
| | 17:42 | 48 | 2.42 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | 2.35 |

* In feet above mean sea level.

¹ No apparent tidal influence.

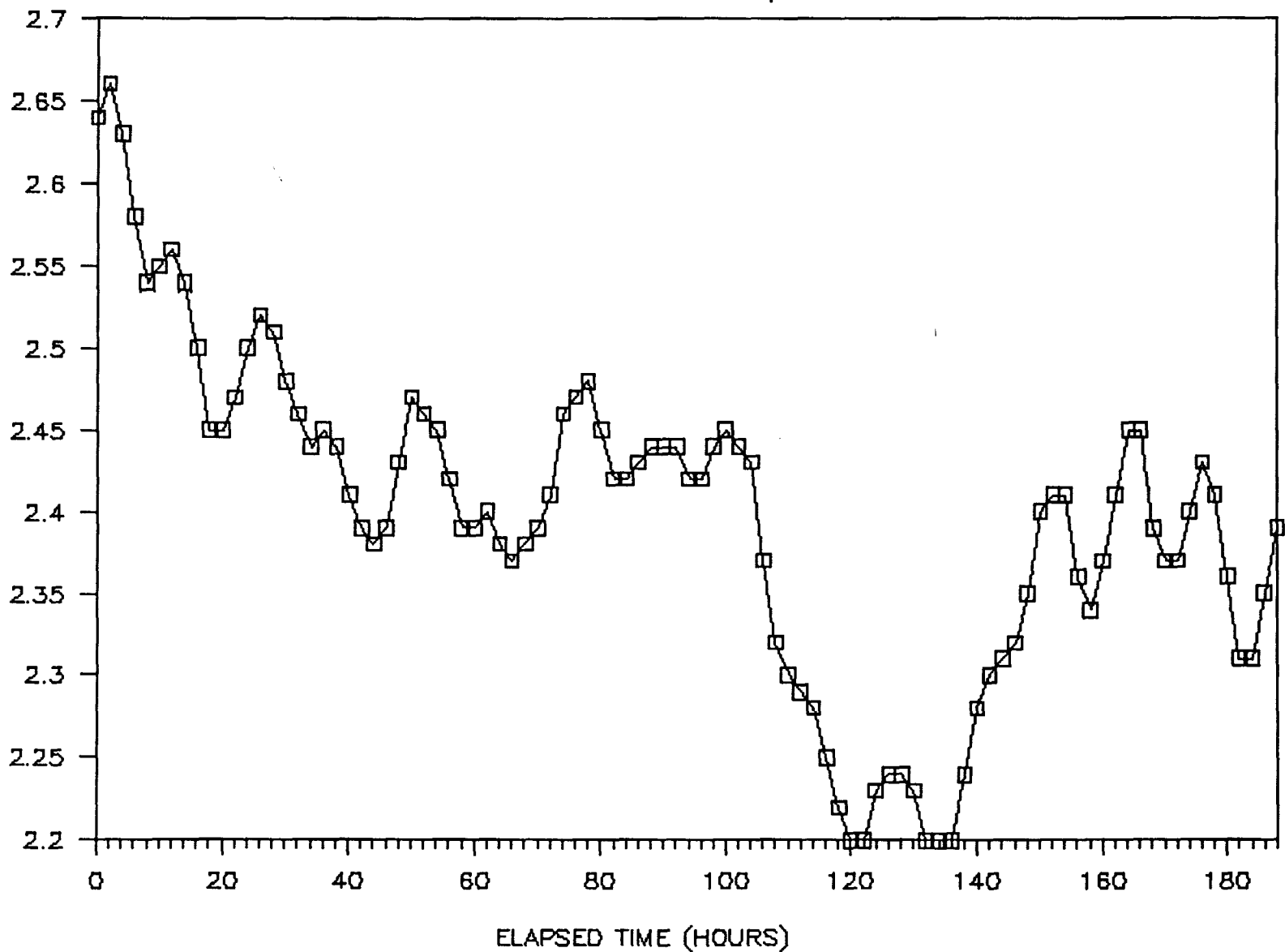
850130700

MO06606J.11.10 7.91

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

LOWER WATER-BEARING ZONE, MW-100

CORRECTED WATER-LEVEL ELEVATION (FEET)



850130701

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, MW-11D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-------------------|--------------------------------|---------------------------------------|---------------------------------|
| 08/29/90 | 13:43:20 | 7.77 | 8.50 | 2.54 | 0 |
| 08/29/90 | 15:43:20 | 7.83 | 8.44 | 2.60 | 2 |
| 08/29/90 | 17:43:20 | 7.82 | 8.45 | 2.59 | 4 |
| 08/29/90 | 19:43:20 | 7.76 | 8.51 | 2.53 | 6 |
| 08/29/90 | 21:43:20 | 7.69 | 8.58 | 2.46 | 8 |
| 08/29/90 | 23:43:20 | 7.65 | 8.62 | 2.42 | 10 |
| 08/30/90 | 01:43:20 | 7.66 | 8.61 | 2.43 | 12 |
| 08/30/90 | 03:43:20 | 7.69 | 8.58 | 2.46 | 14 |
| 08/30/90 | 05:43:20 | 7.68 | 8.59 | 2.45 | 16 |
| 08/30/90 | 07:43:20 | 7.63 | 8.64 | 2.40 | 18 |
| 08/30/90 | 09:43:20 | 7.55 | 8.72 | 2.32 | 20 |
| 08/30/90 | 11:43:20 | 7.55 | 8.72 | 2.32 | 22 |
| 08/30/90 | 13:43:20 | 7.61 | 8.66 | 2.38 | 24 |
| 08/30/90 | 15:43:20 | 7.68 | 8.59 | 2.45 | 26 |
| 08/30/90 | 17:43:20 | 7.69 | 8.58 | 2.46 | 28 |
| 08/30/90 | 19:43:20 | 7.66 | 8.61 | 2.43 | 30 |
| 08/30/90 | 21:43:20 | 7.59 | 8.68 | 2.36 | 32 |
| 08/30/90 | 23:43:20 | 7.54 | 8.73 | 2.31 | 34 |
| 08/31/90 | 01:43:20 | 7.54 | 8.73 | 2.31 | 36 |
| 08/31/90 | 03:43:20 | 7.58 | 8.69 | 2.35 | 38 |
| 08/31/90 | 05:43:20 | 7.57 | 8.70 | 2.34 | 40 |
| 08/31/90 | 07:43:20 | 7.56 | 8.71 | 2.33 | 42 |
| 08/31/90 | 09:43:20 | 7.51 | 8.76 | 2.28 | 44 |
| 08/31/90 | 11:43:20 | 7.47 | 8.80 | 2.24 | 46 |
| 08/31/90 | 13:43:20 | 7.51 | 8.76 | 2.28 | 48 |
| 08/31/90 | 15:43:20 | 7.59 | 8.68 | 2.36 | 50 |
| >08/31/90 | 17:43:20 | 7.64 | 8.63 | 2.41 | 52 - |
| 08/31/90 | 19:43:20 | 7.63 | 8.64 | 2.40 | 54 |
| 08/31/90 | 21:43:20 | 7.57 | 8.70 | 2.34 | 56 |
| 08/31/90 | 23:43:20 | 7.49 | 8.78 | 2.26 | 58 |
| 09/01/90 | 01:43:20 | 7.46 | 8.81 | 2.23 | 60 |
| 09/01/90 | 03:43:20 | 7.51 | 8.76 | 2.28 | 62 |
| 09/01/90 | 05:43:20 | 7.54 | 8.73 | 2.31 | 64 |
| 09/01/90 | 07:43:20 | 7.54 | 8.73 | 2.31 | 66 |
| 09/01/90 | 09:43:20 | 7.50 | 8.77 | 2.27 | 68 |
| 09/01/90 | 11:43:20 | 7.46 | 8.81 | 2.23 | 70 |
| 09/01/90 | 13:43:20 | 7.46 | 8.81 | 2.23 | 72 |
| 09/01/90 | 15:43:20 | 7.54 | 8.73 | 2.31 | 74 |
| 09/01/90 | 17:43:20 | 7.62 | 8.65 | 2.39 | 76 |
| 09/01/90 | 19:43:20 | 7.64 | 8.63 | 2.41 | 78 |
| 09/01/90 | 21:43:20 | 7.61 | 8.66 | 2.38 | 80 |

850130702

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, MW-11D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-------------------|--------------------------------|---------------------------------------|---------------------------------|
| 09/01/90 | 23:43:20 | 7.53 | 8.74 | 2.30 | 82 |
| 09/02/90 | 01:43:20 | 7.48 | 8.79 | 2.25 | 84 |
| 09/02/90 | 03:43:20 | 7.52 | 8.75 | 2.29 | 86 |
| 09/02/90 | 05:43:20 | 7.57 | 8.70 | 2.34 | 88 |
| 09/02/90 | 07:43:20 | 7.60 | 8.67 | 2.37 | 90 |
| 09/02/90 | 09:43:20 | 7.59 | 8.68 | 2.36 | 92 |
| 09/02/90 | 11:43:20 | 7.54 | 8.73 | 2.31 | 94 |
| 09/02/90 | 13:43:20 | 7.50 | 8.77 | 2.27 | 96 |
| 09/02/90 | 15:43:20 | 7.54 | 8.73 | 2.31 | 98 |
| 09/02/90 | 17:43:20 | 7.61 | 8.66 | 2.38 | 100 |
| 09/02/90 | 19:43:20 | 7.65 | 8.62 | 2.42 | 102 |
| 09/02/90 | 21:43:20 | 7.62 | 8.65 | 2.39 | 104 |
| 09/02/90 | 23:43:20 | 7.55 | 8.72 | 2.32 | 106 |
| 09/03/90 | 01:43:20 | 7.45 | 8.82 | 2.22 | 108 |
| 09/03/90 | 03:43:20 | 7.41 | 8.86 | 2.18 | 110 |
| 09/03/90 | 05:43:20 | 7.43 | 8.84 | 2.20 | 112 |
| 09/03/90 | 07:43:20 | 7.47 | 8.80 | 2.24 | 114 |
| 09/03/90 | 09:43:20 | 7.46 | 8.81 | 2.23 | 116 |
| 09/03/90 | 11:43:20 | 7.39 | 8.88 | 2.16 | 118 |
| 09/03/90 | 13:43:20 | 7.31 | 8.96 | 2.08 | 120 |
| 09/03/90 | 15:43:20 | 7.29 | 8.98 | 2.06 | 122 |
| 09/03/90 | 17:43:20 | 7.35 | 8.92 | 2.12 | 124 |
| 09/03/90 | 19:43:20 | 7.42 | 8.85 | 2.19 | 126 |
| 09/03/90 | 21:43:20 | 7.45 | 8.82 | 2.22 | 128 |
| 09/03/90 | 23:43:20 | 7.41 | 8.86 | 2.18 | 130 |
| 09/04/90 | 01:43:20 | 7.32 | 8.95 | 2.09 | 132 |
| 09/04/90 | 03:43:20 | 7.27 | 9.00 | 2.04 | 134 |
| 09/04/90 | 05:43:20 | 7.32 | 8.95 | 2.09 | 136 |
| 09/04/90 | 07:43:20 | 7.39 | 8.88 | 2.16 | 138 |
| 09/04/90 | 09:43:20 | 7.44 | 8.83 | 2.21 | 140 |
| 09/04/90 | 11:43:20 | 7.43 | 8.84 | 2.20 | 142 |
| 09/04/90 | 13:43:20 | 7.40 | 8.87 | 2.17 | 144 |
| 09/04/90 | 15:43:20 | 7.38 | 8.89 | 2.15 | 146 |
| 09/04/90 | 17:43:20 | 7.44 | 8.83 | 2.21 | 148 |
| 09/04/90 | 19:43:20 | 7.54 | 8.73 | 2.31 | 150 |
| 09/04/90 | 21:43:20 | 7.60 | 8.67 | 2.37 | 152 |
| 09/04/90 | 23:43:20 | 7.58 | 8.69 | 2.35 | 154 |
| 09/05/90 | 01:43:20 | 7.50 | 8.77 | 2.27 | 156 |
| 09/05/90 | 03:43:20 | 7.41 | 8.86 | 2.18 | 158 |
| 09/05/90 | 05:43:20 | 7.43 | 8.84 | 2.20 | 160 |
| 09/05/90 | 07:43:20 | 7.53 | 8.74 | 2.30 | 162 |

850130703

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, MW-11D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION(MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-------------------|--------------------------------|---------------------------------------|---------------------------------|
| 09/05/90 | 09:43:20 | 7.61 | 8.66 | 2.38 | 164 |
| 09/05/90 | 11:43:20 | 7.62 | 8.65 | 2.39 | 166 |
| 09/05/90 | 13:43:20 | 7.55 | 8.72 | 2.32 | 168 |
| 09/05/90 | 15:43:20 | 7.44 | 8.83 | 2.21 | 170 |
| 09/05/90 | 17:43:20 | 7.44 | 8.83 | 2.21 | 172 |
| 09/05/90 | 19:43:20 | 7.52 | 8.75 | 2.29 | 174 |
| 09/05/90 | 21:43:20 | 7.59 | 8.68 | 2.36 | 176 |
| 09/05/90 | 23:43:20 | 7.59 | 8.68 | 2.36 | 178 |
| 09/06/90 | 01:43:20 | 7.52 | 8.75 | 2.29 | 180 |
| 09/06/90 | 03:43:20 | 7.40 | 8.87 | 2.17 | 182 |
| 09/06/90 | 05:43:20 | 7.36 | 8.91 | 2.13 | 184 |
| 09/06/90 | 07:43:20 | 7.45 | 8.82 | 2.22 | 186 |
| 09/06/90 | 09:43:20 | 7.53 | 8.74 | 2.30 | 188 |
| 09/06/90 | 11:43:20 | 7.58 | 8.69 | 2.35 | 190 |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-11D, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:43 | 0 | 2.41 |
| | 19:43 | 2 | 2.40 |
| | 21:43 | 4 | 2.34 |
| | 23:43 | 6 | 2.26 |
| 09/01/91 | 01:43 | 8 | 2.23 |
| | 03:43 | 10 | 2.28 |
| | 05:43 | 12 | 2.31 |
| | 07:43 | 14 | 2.31 |
| | 09:43 | 16 | 2.27 |
| | 11:43 | 18 | 2.23 |
| | 13:43 | 20 | 2.23 |
| | 15:43 | 22 | 2.31 |
| | 17:43 | 24 | 2.39 |
| | 19:43 | 26 | 2.41 |
| | 21:43 | 28 | 2.38 |
| | 23:43 | 30 | 2.30 |
| 09/02/91 | 01:43 | 32 | 2.25 |
| | 03:43 | 34 | 2.29 |
| | 05:43 | 36 | 2.34 |
| | 07:43 | 38 | 2.37 |
| | 09:43 | 40 | 2.36 |
| | 11:43 | 42 | 2.31 |
| | 13:43 | 44 | 2.27 |
| | 15:43 | 46 | 2.31 |
| | 17:43 | 48 | 2.38 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | 2.24 |

* In feet above mean sea level.

¹ No apparent tidal influence.

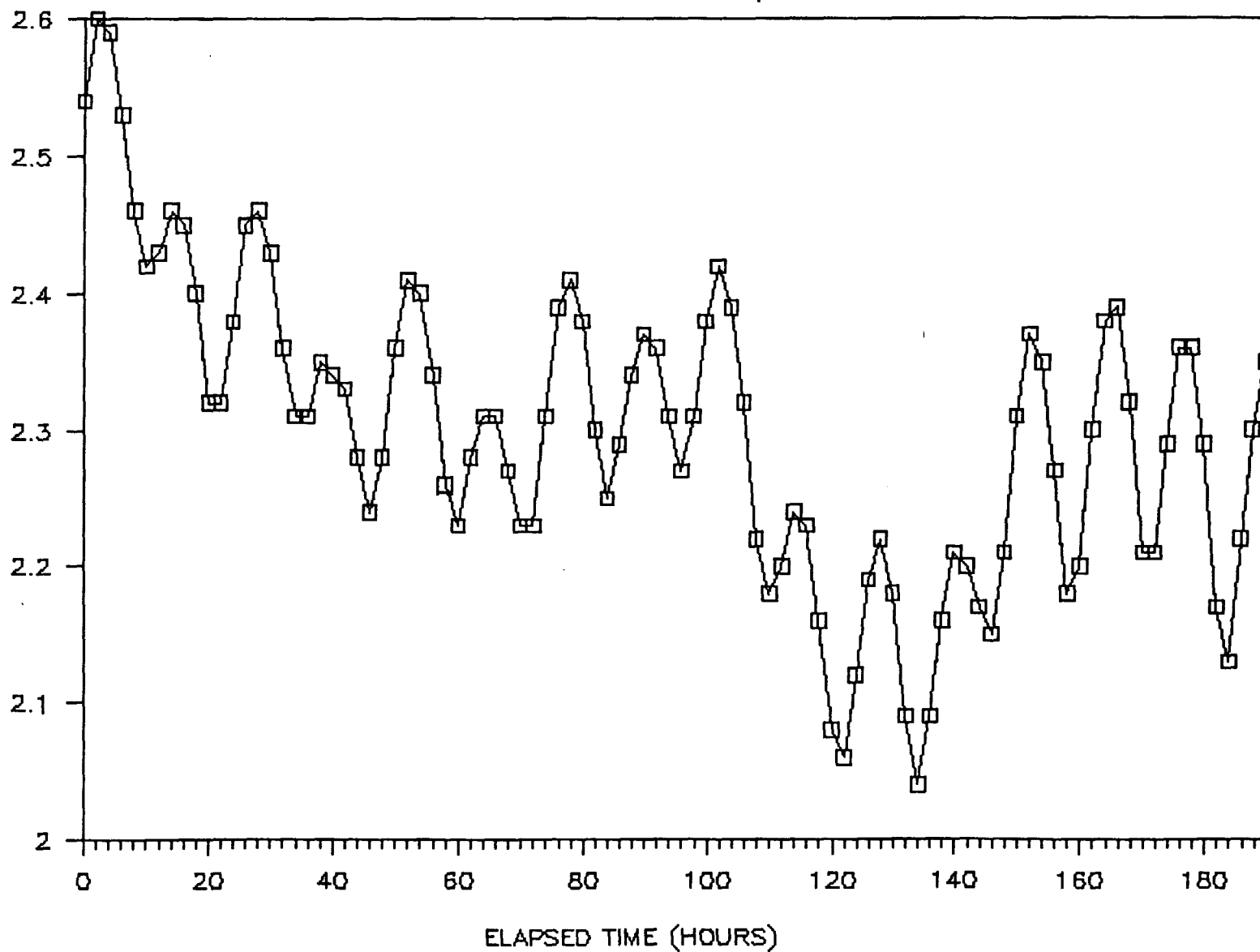
850130705

MO06606J.11.10 7.91

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

LOWER WATER-BEARING ZONE, MW-11D

CORRECTED WATER-LEVEL ELEVATION (FEET)



850130706

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-13D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|----------------------------|----------------------------------------|---------------------------------|
| 08/29/90 | 13:49:23 | 9.15 | 9.58 | 1.21 | 0 |
| 08/29/90 | 15:49:23 | 9.53 | 9.20 | 1.59 | 2 |
| 08/29/90 | 17:49:23 | 8.72 | 10.01 | 0.78 | 4 |
| 08/29/90 | 19:49:23 | 7.70 | 11.03 | -0.24 | 6 |
| 08/29/90 | 21:49:23 | 7.26 | 11.47 | -0.68 | 8 |
| 08/29/90 | 23:49:23 | 7.48 | 11.25 | -0.46 | 10 |
| 08/30/90 | 01:49:23 | 8.26 | 10.47 | 0.32 | 12 |
| 08/30/90 | 03:49:23 | 8.78 | 9.95 | 0.84 | 14 |
| 08/30/90 | 05:49:23 | 8.56 | 10.17 | 0.62 | 16 |
| 08/30/90 | 07:49:23 | 7.59 | 11.14 | -0.35 | 18 |
| 08/30/90 | 09:49:23 | 6.96 | 11.77 | -0.98 | 20 |
| 08/30/90 | 11:49:23 | 7.67 | 11.06 | -0.27 | 22 |
| 08/30/90 | 13:49:23 | 8.77 | 9.96 | 0.83 | 24 |
| 08/30/90 | 15:49:23 | 9.29 | 9.44 | 1.35 | 26 |
| 08/30/90 | 17:49:23 | 9.20 | 9.53 | 1.26 | 28 |
| 08/30/90 | 19:49:23 | 8.22 | 10.51 | 0.28 | 30 |
| 08/30/90 | 21:49:23 | 7.26 | 11.47 | -0.68 | 32 |
| 08/30/90 | 23:49:23 | 6.99 | 11.74 | -0.95 | 34 |
| 08/31/90 | 01:49:23 | 7.85 | 10.88 | -0.09 | 36 |
| 08/31/90 | 03:49:23 | 8.67 | 10.06 | 0.73 | 38 |
| 08/31/90 | 05:49:23 | 8.54 | 10.19 | 0.6 | 40 |
| 08/31/90 | 07:49:23 | 7.93 | 10.80 | -0.01 | 42 |
| 08/31/90 | 09:49:23 | 7.16 | 11.57 | -0.78 | 44 |
| 08/31/90 | 11:49:23 | 7.00 | 11.73 | -0.94 | 46 |
| 08/31/90 | 13:49:23 | 8.01 | 10.72 | 0.07 | 48 |
| 08/31/90 | 15:49:23 | 9.13 | 9.60 | 1.19 | 50 |
| 08/31/90 | 17:49:23 | 9.31 | 9.42 | 1.37 | 52 |
| 08/31/90 | 19:49:23 | 8.71 | 10.02 | 0.77 | 54 |
| 08/31/90 | 21:49:23 | 7.43 | 11.30 | -0.51 | 56 |
| 08/31/90 | 23:49:23 | 6.50 | 12.23 | -1.44 | 58 |
| 09/01/90 | 01:49:23 | 7.09 | 11.64 | -0.85 | 60 |
| 09/01/90 | 03:49:23 | 8.28 | 10.45 | 0.34 | 62 |
| 09/01/90 | 05:49:23 | 8.68 | 10.05 | 0.74 | 64 |
| 09/01/90 | 07:49:23 | 8.25 | 10.48 | 0.31 | 66 |
| 09/01/90 | 09:49:23 | 7.33 | 11.40 | -0.61 | 68 |
| 09/01/90 | 11:49:23 | 6.77 | 11.96 | -1.17 | 70 |
| 09/01/90 | 13:49:23 | 7.33 | 11.40 | -0.61 | 72 |
| 09/01/90 | 15:49:23 | 8.80 | 9.93 | 0.86 | 74 |
| 09/01/90 | 17:49:23 | 9.64 | 9.09 | 1.7 | 76 |
| 09/01/90 | 19:49:23 | 9.29 | 9.44 | 1.35 | 78 |

850130707

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-13D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|--------------------------------|----------------------------------------|---------------------------------|
| 09/01/90 | 21:49:23 | 8.03 | 10.70 | 0.09 | 80 |
| 09/01/90 | 23:49:23 | 6.83 | 11.90 | -1.11 | 82 |
| 09/02/90 | 01:49:23 | 6.79 | 11.94 | -1.15 | 84 |
| 09/02/90 | 03:49:23 | 8.07 | 10.66 | 0.13 | 86 |
| 09/02/90 | 05:49:23 | 8.95 | 9.78 | 1.01 | 88 |
| 09/02/90 | 07:49:23 | 8.97 | 9.76 | 1.03 | 90 |
| 09/02/90 | 09:49:23 | 8.03 | 10.70 | 0.09 | 92 |
| 09/02/90 | 11:49:23 | 7.00 | 11.73 | -0.94 | 94 |
| 09/02/90 | 13:49:23 | 6.92 | 11.81 | -1.02 | 96 |
| 09/02/90 | 15:49:23 | 8.39 | 10.34 | 0.45 | 98 |
| 09/02/90 | 17:49:23 | 9.68 | 9.05 | 1.74 | 100 |
| 09/02/90 | 19:49:23 | 9.81 | 8.92 | 1.87 | 102 |
| 09/02/90 | 21:49:23 | 8.67 | 10.06 | 0.73 | 104 |
| 09/02/90 | 23:49:23 | 7.17 | 11.56 | -0.77 | 106 |
| 09/03/90 | 01:49:23 | 6.56 | 12.17 | -1.38 | 108 |
| 09/03/90 | 03:49:23 | 7.39 | 11.34 | -0.55 | 110 |
| 09/03/90 | 05:49:23 | 8.87 | 9.86 | 0.93 | 112 |
| 09/03/90 | 07:49:23 | 9.38 | 9.35 | 1.44 | 114 |
| 09/03/90 | 09:49:23 | 8.43 | 10.30 | 0.49 | 116 |
| 09/03/90 | 11:49:23 | 7.27 | 11.46 | -0.67 | 118 |
| 09/03/90 | 13:49:23 | 6.67 | 12.06 | -1.27 | 120 |
| 09/03/90 | 15:49:23 | 7.61 | 11.12 | -0.33 | 122 |
| 09/03/90 | 17:49:23 | 9.32 | 9.41 | 1.38 | 124 |
| 09/03/90 | 19:49:23 | 10.11 | 8.62 | 2.17 | 126 |
| 09/03/90 | 21:49:23 | 9.59 | 9.14 | 1.65 | 128 |
| 09/03/90 | 23:49:23 | 8.01 | 10.72 | 0.07 | 130 |
| 09/04/90 | 01:49:23 | 6.86 | 11.87 | -1.08 | 132 |
| 09/04/90 | 03:49:23 | 7.24 | 11.49 | -0.7 | 134 |
| 09/04/90 | 05:49:23 | 8.92 | 9.81 | 0.98 | 136 |
| 09/04/90 | 07:49:23 | 10.02 | 8.71 | 2.08 | 138 |
| 09/04/90 | 09:49:23 | 9.60 | 9.13 | 1.66 | 140 |
| 09/04/90 | 11:49:23 | 8.25 | 10.48 | 0.31 | 142 |
| 09/04/90 | 13:49:23 | 7.13 | 11.60 | -0.81 | 144 |
| 09/04/90 | 15:49:23 | 7.26 | 11.47 | -0.68 | 146 |
| 09/04/90 | 17:49:23 | 9.08 | 9.65 | 1.14 | 148 |
| 09/04/90 | 19:49:23 | 10.42 | 8.31 | 2.48 | 150 |
| 09/04/90 | 21:49:23 | 10.13 | 8.60 | 2.19 | 152 |
| 09/04/90 | 23:49:23 | 8.50 | 10.23 | 0.56 | 154 |
| 09/05/90 | 01:49:23 | 7.04 | 11.69 | -0.9 | 156 |
| 09/05/90 | 03:49:23 | 6.61 | 12.12 | -1.33 | 158 |

850130708

MONSANTO KEARNY WATER-LEVEL ELEVATIONS
 LOWER WATER-BEARING ZONE, WELL MW-13D
 AUGUST 29 THROUGH SEPTEMBER 6, 1990

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
HEAD</u> | <u>CORRECTED
DTW (PVC)</u> | <u>WATER-LEVEL
ELEVATION (MSL)</u> | <u>ELAPSED TIME
(HOURS)</u> |
|-------------|-------------|-----------------------|--------------------------------|----------------------------------------|---------------------------------|
| 09/05/90 | 05:49:23 | 8.18 | 10.55 | 0.24 | 160 |
| 09/05/90 | 07:49:23 | 9.73 | 9.00 | 1.79 | 162 |
| 09/05/90 | 09:49:23 | 9.81 | 8.92 | 1.87 | 164 |
| 09/05/90 | 11:49:23 | 8.53 | 10.20 | 0.59 | 166 |
| 09/05/90 | 13:49:23 | 7.02 | 11.71 | -0.92 | 168 |
| 09/05/90 | 15:49:23 | 6.40 | 12.33 | -1.54 | 170 |
| 09/05/90 | 17:49:23 | 7.97 | 10.76 | 0.03 | 172 |
| 09/05/90 | 19:49:23 | 9.68 | 9.05 | 1.74 | 174 |
| 09/05/90 | 21:49:23 | 9.92 | 8.81 | 1.98 | 176 |
| 09/05/90 | 23:49:23 | 8.71 | 10.02 | 0.77 | 178 |
| 09/06/90 | 01:49:23 | 7.08 | 11.65 | -0.86 | 180 |
| 09/06/90 | 03:49:23 | 6.19 | 12.54 | -1.75 | 182 |
| 09/06/90 | 05:49:23 | 7.42 | 11.31 | -0.52 | 184 |
| 09/06/90 | 07:49:23 | 9.41 | 9.32 | 1.47 | 186 |
| 09/06/90 | 09:49:23 | 10.12 | 8.61 | 2.18 | 188 |
| 09/06/90 | 11:49:23 | 9.25 | 9.48 | 1.31 | 190 |

Two-Hour Water-Level Measurements in Ground-Water Monitoring Well MW-13D, August 31 through September 2, 1990. Monsanto Kearny Plant; Kearny, New Jersey.

| Date | Real Time
(Hours:Minutes) | Elapsed Time
(Hours) | Water-Level Elevation
(Feet) |
|--------------------|--------------------------------------|---------------------------------|-------------------------------------------|
| 08/31/91 | 17:49 | 0 | 1.37 |
| | 19:49 | 2 | 0.77 |
| | 21:49 | 4 | -0.51 |
| | 23:49 | 6 | -1.44 |
| 09/01/91 | 01:49 | 8 | -0.85 |
| | 03:49 | 10 | 0.34 |
| | 05:49 | 12 | 0.74 |
| | 07:49 | 14 | 0.31 |
| | 09:49 | 16 | -0.61 |
| | 11:49 | 18 | -1.17 |
| | 13:49 | 20 | -0.61 |
| | 15:49 | 22 | 0.86 |
| | 17:49 | 24 | 1.7 |
| | 19:49 | 26 | 1.35 |
| | 21:49 | 28 | 0.09 |
| | 23:49 | 30 | -1.11 |
| 09/02/91 | 01:49 | 32 | -1.15 |
| | 03:49 | 34 | 0.13 |
| | 05:49 | 36 | 1.01 |
| | 07:49 | 38 | 1.03 |
| | 09:49 | 40 | 0.09 |
| | 11:49 | 42 | -0.94 |
| | 13:49 | 44 | -1.02 |
| | 15:49 | 46 | 0.45 |
| | 17:49 | 48 | 1.74 |
| Total Hours | | | Average Water-Level
Elevation* |
| 50 | | | .10 |

* In feet above mean sea level.

† No apparent tidal influence.

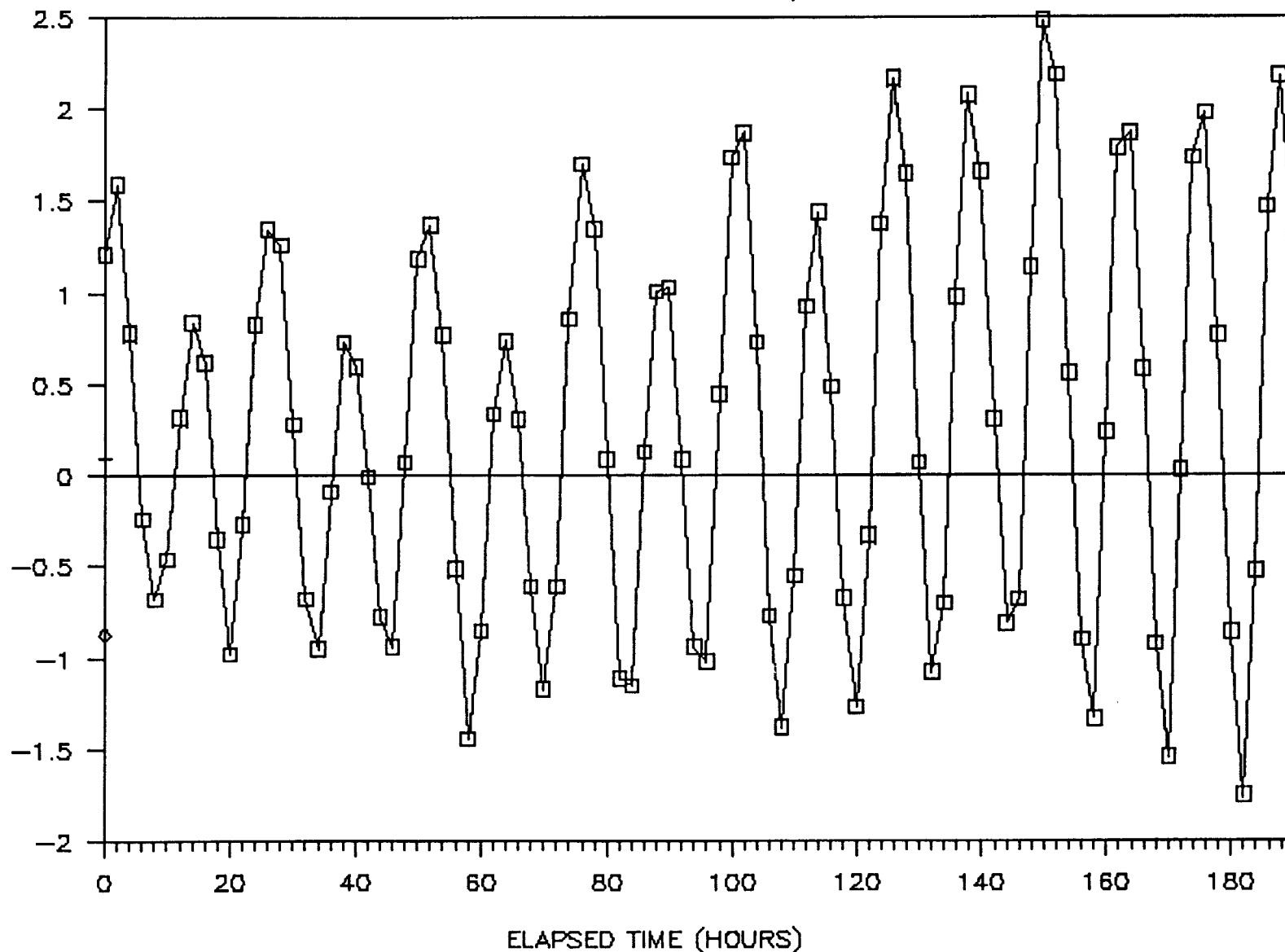
850130710

MO06606J.11.10 7.91

WATER-LEVEL ELEVATIONS, 8/29/90-9/6/90

LOWER-WATER BEARING ZONE, MW13D

CORRECTED WATER-LEVEL ELEVATION (FEET)



850130711

APPENDIX H

Seasonal Water-Level Measurements.

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
FALL 1990; MONITORING WELL MW-11S

| <u>DATE</u> | <u>TIME</u> | TELOG
AVERAGE
HEAD
(Ft) | CORRECTED
DTW*(Ft)
(PVC CASING) | WATER
LEVEL
ELEVATION
(Ft,MSL) | DAY
COUNTER |
|----------------|-------------|----------------------------------|---------------------------------------|-----------------------------------------|----------------|
| 08/29/90 | 17:45:24 | 5.64 | 2.82 | 8.05 | 0 |
| 08/30/90 | 17:45:24 | 5.55 | 2.91 | 7.96 | 1 |
| 08/31/90 | 17:45:24 | 5.48 | 2.98 | 7.89 | 2 |
| 09/01/90 | 17:45:24 | 5.44 | 3.02 | 7.85 | 3 |
| 09/02/90 | 17:45:24 | 5.38 | 3.08 | 7.79 | 4 |
| 09/03/90 | 17:45:24 | 5.32 | 3.14 | 7.73 | 5 |
| 09/04/90 | 17:45:24 | 5.31 | 3.15 | 7.72 | 6 |
| 09/05/90 | 17:45:24 | 5.29 | 3.17 | 7.70 | 7 |
| 09/06/90 | 17:45:24 | 5.27 | 3.19 | 7.68 | 8 |
| 09/07/90 | 17:45:24 | 5.18 | 3.28 | 7.59 | 9 |
| 09/08/90 | 17:45:24 | 5.14 | 3.32 | 7.55 | 10 |
| 09/09/90 | 17:45:24 | 5.04 | 3.42 | 7.45 | 11 |
| 09/10/90 | 17:45:24 | 4.83 | 3.63 | 7.24 | 12 |
| no measurement | | | | | 13 |
| 09/12/90 | 17:45:24 | 4.78 | 3.68 | 7.19 | 14 |
| 09/13/90 | 17:45:24 | 5.01 | 3.45 | 7.42 | 15 |
| 09/14/90 | 17:45:24 | 5.23 | 3.23 | 7.64 | 16 |
| 09/15/90 | 17:45:24 | 5.09 | 3.37 | 7.50 | 17 |
| 09/16/90 | 17:45:24 | 4.81 | 3.65 | 7.22 | 18 |
| 09/17/90 | 17:45:24 | 4.74 | 3.72 | 7.15 | 19 |
| 09/18/90 | 17:45:24 | 4.73 | 3.73 | 7.14 | 20 |
| 09/19/90 | 17:45:24 | 4.84 | 3.62 | 7.25 | 21 |
| 09/20/90 | 17:45:24 | 4.62 | 3.84 | 7.03 | 22 |
| 09/21/90 | 17:45:24 | 4.64 | 3.82 | 7.05 | 23 |
| 09/22/90 | 17:45:24 | 4.90 | 3.56 | 7.31 | 24 |
| 09/23/90 | 17:45:24 | 4.79 | 3.67 | 7.20 | 25 |
| 09/24/90 | 17:45:24 | 4.73 | 3.73 | 7.14 | 26 |
| 09/25/90 | 17:45:24 | 4.70 | 3.76 | 7.11 | 27 |
| 09/26/90 | 17:45:24 | 4.63 | 3.83 | 7.04 | 28 |
| 09/27/90 | 17:45:24 | 4.57 | 3.89 | 6.98 | 29 |
| 09/28/90 | 17:45:24 | 4.54 | 3.92 | 6.95 | 30 |
| 09/29/90 | 17:45:24 | 4.52 | 3.94 | 6.93 | 31 |
| 09/30/90 | 17:45:24 | 4.48 | 3.98 | 6.89 | 32 |

*DTW = DEPTH TO WATER
MSL = RELATIVE TO MEAN SEA LEVEL

850130713

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
FALL 1990; MONITORING WELL MW-11D

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
AVERAGE
HEAD</u> | <u>CORRECTED
DTW*(Ft)
(PVC CASING)</u> | <u>WATER
LEVEL
ELEVATION
(Ft,MSL)</u> | <u>DAY
COUNTER</u> |
|----------------|-------------|-----------------------------------|------------------------------------------------|---------------------------------------------------|------------------------|
| 08/29/90 | 17:43:20 | 7.66 | 8.50 | 2.54 | 0 |
| 08/30/90 | 17:43:20 | 7.57 | 8.59 | 2.45 | 1 |
| 08/31/90 | 17:43:20 | 7.53 | 8.63 | 2.41 | 2 |
| 09/01/90 | 17:43:20 | 7.56 | 8.60 | 2.44 | 3 |
| 09/02/90 | 17:43:20 | 7.47 | 8.69 | 2.35 | 4 |
| 09/03/90 | 17:43:20 | 7.38 | 8.78 | 2.26 | 5 |
| 09/04/90 | 17:43:20 | 7.52 | 8.64 | 2.40 | 6 |
| 09/05/90 | 17:43:20 | 7.50 | 8.66 | 2.38 | 7 |
| 09/06/90 | 17:43:20 | 7.56 | 8.60 | 2.44 | 8 |
| 09/07/90 | 17:43:20 | 7.32 | 8.84 | 2.20 | 9 |
| 09/08/90 | 17:43:20 | 7.35 | 8.81 | 2.23 | 10 |
| 09/09/90 | 17:43:20 | 7.46 | 8.70 | 2.34 | 11 |
| 09/10/90 | 17:43:20 | 7.35 | 8.81 | 2.23 | 12 |
| no measurement | | | | | 13 |
| 09/12/90 | 17:43:20 | 7.24 | 8.92 | 2.12 | 14 |
| 09/13/90 | 17:43:20 | 7.39 | 8.77 | 2.27 | 15 |
| 09/14/90 | 17:43:20 | 7.60 | 8.56 | 2.48 | 16 |
| 09/15/90 | 17:43:20 | 7.40 | 8.76 | 2.28 | 17 |
| 09/16/90 | 17:43:20 | 7.27 | 8.89 | 2.15 | 18 |
| 09/17/90 | 17:43:20 | 7.18 | 8.98 | 2.06 | 19 |
| 09/18/90 | 17:43:20 | 7.26 | 8.90 | 2.14 | 20 |
| 09/19/90 | 17:43:20 | 7.36 | 8.80 | 2.24 | 21 |
| 09/20/90 | 17:43:20 | 7.19 | 8.97 | 2.07 | 22 |
| 09/21/90 | 17:43:20 | 7.36 | 8.80 | 2.24 | 23 |
| 09/22/90 | 17:43:20 | 7.51 | 8.65 | 2.39 | 24 |
| 09/23/90 | 17:43:20 | 7.28 | 8.88 | 2.16 | 25 |
| 09/24/90 | 17:43:20 | 7.19 | 8.97 | 2.07 | 26 |
| 09/25/90 | 17:43:20 | 7.24 | 8.92 | 2.12 | 27 |
| 09/26/90 | 17:43:20 | 7.16 | 9.00 | 2.04 | 28 |
| 09/27/90 | 17:43:20 | 7.10 | 9.06 | 1.98 | 29 |
| 09/28/90 | 17:43:20 | 7.10 | 9.06 | 1.98 | 30 |
| 09/29/90 | 17:43:20 | 7.11 | 9.05 | 1.99 | 31 |
| 09/30/90 | 17:43:20 | 7.09 | 9.07 | 1.97 | 32 |

*DTW = DEPTH TO WATER
MSL = RELATIVE TO MEAN SEA LEVEL

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
WINTER 1990; MONITORING WELL MW-11S

| <u>DATE</u> | <u>TIME</u> | TELOG
AVERAGE
<u>HEAD(Ft)</u> | CORRECTED
DTW*(Ft)
<u>(STEEL CASING)</u> | WATER
LEVEL
ELEVATION
<u>(Ft, MSL)</u> | DAY
COUNTER |
|-------------|-------------|-------------------------------------|------------------------------------------------|-------------------------------------------------|----------------|
| 12/18/90 | 05:15:06 | 6.49 | 4.50 | 6.37 | 0 |
| 12/19/90 | 05:15:06 | 6.38 | 4.61 | 6.26 | 1 |
| 12/20/90 | 05:15:06 | 6.31 | 4.68 | 6.19 | 2 |
| 12/21/90 | 05:15:06 | 6.38 | 4.61 | 6.26 | 3 |
| 12/22/90 | 05:15:06 | 6.47 | 4.52 | 6.35 | 4 |
| 12/23/90 | 05:15:06 | 6.53 | 4.46 | 6.41 | 5 |
| 12/24/90 | 05:15:06 | 6.72 | 4.27 | 6.60 | 6 |
| 12/25/90 | 05:15:06 | 6.68 | 4.31 | 6.56 | 7 |
| 12/26/90 | 05:15:06 | 6.59 | 4.40 | 6.47 | 8 |
| 12/27/90 | 05:15:06 | 6.51 | 4.48 | 6.39 | 9 |
| 12/28/90 | 05:15:06 | 6.47 | 4.52 | 6.35 | 10 |
| 12/29/90 | 05:15:06 | 6.50 | 4.49 | 6.38 | 11 |
| 12/30/90 | 05:15:06 | 6.76 | 4.23 | 6.64 | 12 |
| 12/31/90 | 05:15:06 | 6.87 | 4.12 | 6.75 | 13 |
| 01/01/91 | 05:15:06 | 6.78 | 4.21 | 6.66 | 14 |
| 01/02/91 | 05:15:06 | 6.72 | 4.27 | 6.60 | 15 |
| 01/03/91 | 05:15:06 | 6.61 | 4.38 | 6.49 | 16 |
| 01/04/91 | 05:15:06 | 6.51 | 4.48 | 6.39 | 17 |
| 01/05/91 | 05:15:06 | 6.47 | 4.52 | 6.35 | 18 |
| 01/06/91 | 05:15:06 | 6.38 | 4.61 | 6.26 | 19 |
| 01/07/91 | 05:15:06 | 6.30 | 4.69 | 6.18 | 20 |
| 01/08/91 | 05:15:06 | 6.24 | 4.75 | 6.12 | 21 |
| 01/09/91 | 05:15:06 | 6.27 | 4.72 | 6.15 | 22 |
| 01/10/91 | 05:15:06 | 6.22 | 4.77 | 6.10 | 23 |
| 01/11/91 | 05:15:06 | 6.28 | 4.71 | 6.16 | 24 |
| 01/12/91 | 05:15:06 | 6.57 | 4.42 | 6.45 | 25 |
| 01/13/91 | 05:15:06 | 6.61 | 4.38 | 6.49 | 26 |
| 01/14/91 | 05:15:06 | 6.58 | 4.41 | 6.46 | 27 |
| 01/15/91 | 05:15:06 | 6.51 | 4.48 | 6.39 | 28 |
| 01/16/91 | 05:15:06 | 7.01 | 3.98 | 6.89 | 29 |
| 01/17/91 | 05:15:06 | 7.19 | 3.80 | 7.07 | 30 |
| 01/18/91 | 05:15:06 | 7.06 | 3.93 | 6.94 | 31 |
| 01/19/91 | 05:15:06 | 6.95 | 4.04 | 6.83 | 32 |
| 01/20/91 | 05:15:06 | 6.87 | 4.12 | 6.75 | 33 |
| 01/21/91 | 05:15:06 | 6.75 | 4.24 | 6.63 | 34 |
| 01/22/91 | 05:15:06 | 6.63 | 4.36 | 6.51 | 35 |

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
WINTER 1990; MONITORING WELL MW-11S

| <u>DATE</u> | <u>TIME</u> | TELOG
AVERAGE
<u>HEAD(Ft)</u> | CORRECTED
DTW*(Ft)
<u>(STEEL CASING)</u> | WATER
LEVEL
ELEVATION
<u>(Ft, MSL)</u> | DAY
COUNTER |
|-------------|-------------|-------------------------------------|------------------------------------------------|-------------------------------------------------|----------------|
| 01/23/91 | 05:15:06 | 6.58 | 4.41 | 6.46 | 36 |
| 01/24/91 | 05:15:06 | 6.49 | 4.50 | 6.37 | 37 |
| 01/25/91 | 05:15:06 | 6.41 | 4.58 | 6.29 | 38 |
| 01/26/91 | 05:15:06 | 6.38 | 4.61 | 6.26 | 39 |
| 01/27/91 | 05:15:06 | 6.33 | 4.66 | 6.21 | 40 |
| 01/28/91 | 05:15:06 | 6.27 | 4.72 | 6.15 | 41 |

*DTW = DEPTH TO WATER
MSL = RELATIVE TO MEAN SEA LEVEL

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
WINTER 1990; MONITORING WELL MW-11D

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
AVERAGE
HEAD(Ft)</u> | <u>CORRECTED
DTW*(Ft)
(PVC CASING)</u> | <u>WATER
LEVEL
ELEVATION
(Ft, MSL)</u> | <u>DAY
COUNTER</u> |
|-------------|-------------|---------------------------------------|------------------------------------------------|----------------------------------------------------|------------------------|
| 12/18/90 | 04:49:51 | 4.82 | 8.95 | 2.09 | 0 |
| 12/19/90 | 04:49:51 | 4.38 | 9.39 | 1.65 | 1 |
| 12/20/90 | 04:49:51 | 4.34 | 9.43 | 1.61 | 2 |
| 12/21/90 | 04:49:51 | 4.66 | 9.11 | 1.93 | 3 |
| 12/22/90 | 04:49:51 | 4.70 | 9.07 | 1.97 | 4 |
| 12/23/90 | 04:49:51 | 4.81 | 8.96 | 2.08 | 5 |
| 12/24/90 | 04:49:51 | 4.61 | 9.16 | 1.88 | 6 |
| 12/25/90 | 04:49:51 | 4.45 | 9.32 | 1.72 | 7 |
| 12/26/90 | 04:49:51 | 4.39 | 9.38 | 1.66 | 8 |
| 12/27/90 | 04:49:51 | 4.33 | 9.44 | 1.60 | 9 |
| 12/28/90 | 04:49:51 | 4.68 | 9.09 | 1.95 | 10 |
| 12/29/90 | 04:49:51 | 4.82 | 8.95 | 2.09 | 11 |
| 12/30/90 | 04:49:51 | 4.95 | 8.82 | 2.22 | 12 |
| 12/31/90 | 04:49:51 | 4.52 | 9.25 | 1.79 | 13 |
| 01/01/91 | 04:49:51 | 4.70 | 9.07 | 1.97 | 14 |
| 01/02/91 | 04:49:51 | 4.89 | 8.88 | 2.16 | 15 |
| 01/03/91 | 04:49:51 | 4.78 | 8.99 | 2.05 | 16 |
| 01/04/91 | 04:49:51 | 4.71 | 9.06 | 1.98 | 17 |
| 01/05/91 | 04:49:51 | 4.77 | 9.00 | 2.04 | 18 |
| 01/06/91 | 04:49:51 | 4.73 | 9.04 | 2.00 | 19 |
| 01/07/91 | 04:49:51 | 4.63 | 9.14 | 1.90 | 20 |
| 01/08/91 | 04:49:51 | 4.69 | 9.08 | 1.96 | 21 |
| 01/09/91 | 04:49:51 | 4.94 | 8.83 | 2.21 | 22 |
| 01/10/91 | 04:49:51 | 4.66 | 9.11 | 1.93 | 23 |
| 01/11/91 | 04:49:51 | 4.90 | 8.87 | 2.17 | 24 |
| 01/12/91 | 04:49:51 | 5.34 | 8.43 | 2.61 | 25 |
| 01/13/91 | 04:49:51 | 5.08 | 8.69 | 2.35 | 26 |
| 01/14/91 | 04:49:51 | 5.02 | 8.75 | 2.29 | 27 |
| 01/15/91 | 04:49:51 | 4.94 | 8.83 | 2.21 | 28 |
| 01/16/91 | 04:49:51 | 5.37 | 8.40 | 2.64 | 29 |
| 01/17/91 | 04:49:51 | 5.19 | 8.58 | 2.46 | 30 |
| 01/18/91 | 04:49:51 | 5.01 | 8.76 | 2.28 | 31 |
| 01/19/91 | 04:49:51 | 4.96 | 8.81 | 2.23 | 32 |
| 01/20/91 | 04:49:51 | 5.22 | 8.55 | 2.49 | 33 |
| 01/21/91 | 04:49:51 | 5.12 | 8.65 | 2.39 | 34 |
| 01/22/91 | 04:49:51 | 4.97 | 8.80 | 2.24 | 35 |

850130717

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
WINTER 1990; MONITORING WELL MW-11D

| <u>DATE</u> | <u>TIME</u> | TELOG
AVERAGE
<u>HEAD(Ft)</u> | CORRECTED
DTW*(Ft)
<u>(PVC CASING)</u> | WATER
LEVEL
ELEVATION
<u>(Ft, MSL)</u> | DAY
COUNTER |
|-------------|-------------|-------------------------------------|----------------------------------------------|-------------------------------------------------|----------------|
| 01/23/91 | 04:49:51 | 5.06 | 8.71 | 2.33 | 36 |
| 01/24/91 | 04:49:51 | 4.82 | 8.95 | 2.09 | 37 |
| 01/25/91 | 04:49:51 | 4.60 | 9.17 | 1.87 | 38 |
| 01/26/91 | 04:49:51 | 4.73 | 9.04 | 2.00 | 39 |
| 01/27/91 | 04:49:51 | 4.67 | 9.10 | 1.94 | 40 |
| 01/28/91 | 04:49:51 | 4.64 | 9.13 | 1.91 | 41 |

*DTW = DEPTH TO WATER

MSL = RELATIVE TO MEAN SEA LEVEL

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
 SPRING 1991; MONITORING WELL MW-11S

| <u>DATE</u> | <u>TIME</u> | TELOG
AVERAGE
<u>HEAD(Ft)</u> | CORRECTED
DTW*(Ft)
<u>(STEEL CASING)</u> | WATER
LEVEL
ELEVATION
<u>(Ft, MSL)</u> | DAY
<u>COUNTER</u> |
|-------------|-------------|-------------------------------------|------------------------------------------------|-------------------------------------------------|-----------------------|
| 04/06/91 | 14:12:00 | 6.26 | 4.70 | 6.17 | 0 |
| 04/07/91 | 14:12:00 | 6.67 | 4.29 | 6.58 | 1 |
| 04/08/91 | 14:12:00 | 6.82 | 4.14 | 6.73 | 2 |
| 04/09/91 | 14:12:00 | 6.82 | 4.14 | 6.73 | 3 |
| 04/10/91 | 14:12:00 | 6.87 | 4.09 | 6.78 | 4 |
| 04/11/91 | 14:12:00 | 6.66 | 4.30 | 6.57 | 5 |
| 04/12/91 | 14:12:00 | 6.44 | 4.52 | 6.35 | 6 |
| 04/13/91 | 14:12:00 | 6.28 | 4.68 | 6.19 | 7 |
| 04/14/91 | 14:12:00 | 6.25 | 4.71 | 6.16 | 8 |
| 04/15/91 | 14:12:00 | 6.25 | 4.71 | 6.16 | 9 |
| 04/16/91 | 14:12:00 | 6.22 | 4.74 | 6.13 | 10 |
| 04/17/91 | 14:12:00 | 6.22 | 4.74 | 6.13 | 11 |
| 04/18/91 | 14:12:00 | 6.25 | 4.71 | 6.16 | 12 |
| 04/19/91 | 14:12:00 | 6.24 | 4.72 | 6.15 | 13 |
| 04/20/91 | 14:12:00 | 6.37 | 4.59 | 6.28 | 14 |
| 04/21/91 | 14:12:00 | 7.32 | 3.64 | 7.23 | 15 |
| 04/22/91 | 14:12:00 | 7.24 | 3.72 | 7.15 | 16 |
| 04/23/91 | 14:12:00 | 7.15 | 3.81 | 7.06 | 17 |
| 04/24/91 | 14:12:00 | 7.05 | 3.91 | 6.96 | 18 |
| 04/25/91 | 14:12:00 | 6.98 | 3.98 | 6.89 | 19 |
| 04/26/91 | 14:12:00 | 6.94 | 4.02 | 6.85 | 20 |
| 04/27/91 | 14:12:00 | 6.86 | 4.10 | 6.77 | 21 |
| 04/28/91 | 14:12:00 | 6.77 | 4.19 | 6.68 | 22 |
| 04/29/91 | 14:12:00 | 6.72 | 4.24 | 6.63 | 23 |
| 04/30/91 | 14:12:00 | 6.67 | 4.29 | 6.58 | 24 |
| 05/01/91 | 14:12:00 | 6.63 | 4.33 | 6.54 | 25 |
| 05/02/91 | 14:12:00 | 6.56 | 4.40 | 6.47 | 26 |
| 05/03/91 | 14:12:00 | 6.50 | 4.46 | 6.41 | 27 |
| 05/04/91 | 14:12:00 | 6.44 | 4.52 | 6.35 | 28 |
| 05/05/91 | 14:12:00 | 6.54 | 4.42 | 6.45 | 29 |
| 05/06/91 | 14:12:00 | 6.59 | 4.37 | 6.50 | 30 |

*DTW = DEPTH TO WATER

MSL = RELATIVE TO MEAN SEA LEVEL

MONSANTO KEARNY: AVERAGE DAILY WATER-LEVEL ELEVATIONS
 SPRING 1991; MONITORING WELL MW-11D

| <u>DATE</u> | <u>TIME</u> | <u>TELOG
AVERAGE
HEAD(Ft)</u> | <u>CORRECTED
DTW*(Ft)
(PVC CASING)</u> | <u>WATER
LEVEL
ELEVATION
(Ft, MSL)</u> | <u>DAY
COUNTER</u> |
|-------------|-------------|---------------------------------------|------------------------------------------------|----------------------------------------------------|------------------------|
| 04/06/91 | 15:06:16 | 10.34 | 9.16 | 1.88 | 0 |
| 04/07/91 | 15:06:16 | 10.35 | 9.15 | 1.89 | 1 |
| 04/08/91 | 15:06:16 | 10.41 | 9.09 | 1.95 | 2 |
| 04/09/91 | 15:06:16 | 10.44 | 9.06 | 1.98 | 3 |
| 04/10/91 | 15:06:16 | 10.26 | 9.24 | 1.80 | 4 |
| 04/11/91 | 15:06:16 | 10.03 | 9.47 | 1.57 | 5 |
| 04/12/91 | 15:06:16 | 10.10 | 9.40 | 1.64 | 6 |
| 04/13/91 | 15:06:16 | 10.31 | 9.19 | 1.85 | 7 |
| 04/14/91 | 15:06:16 | 10.44 | 9.06 | 1.98 | 8 |
| 04/15/91 | 15:06:16 | 10.60 | 8.90 | 2.14 | 9 |
| 04/16/91 | 15:06:16 | 10.47 | 9.03 | 2.01 | 10 |
| 04/17/91 | 15:06:16 | 10.54 | 8.96 | 2.08 | 11 |
| 04/18/91 | 15:06:16 | 10.60 | 8.90 | 2.14 | 12 |
| 04/19/91 | 15:06:16 | 10.78 | 8.72 | 2.32 | 13 |
| 04/20/91 | 15:06:16 | 11.09 | 8.41 | 2.63 | 14 |
| 04/21/91 | 15:06:16 | 11.42 | 8.08 | 2.96 | 15 |
| 04/22/91 | 15:06:16 | 11.23 | 8.27 | 2.77 | 16 |
| 04/23/91 | 15:06:16 | 11.20 | 8.30 | 2.74 | 17 |
| 04/24/91 | 15:06:16 | 11.16 | 8.34 | 2.70 | 18 |
| 04/25/91 | 15:06:16 | 11.06 | 8.44 | 2.60 | 19 |
| 04/26/91 | 15:06:16 | 11.18 | 8.32 | 2.72 | 20 |
| 04/27/91 | 15:06:16 | 11.16 | 8.34 | 2.70 | 21 |
| 04/28/91 | 15:06:16 | 11.06 | 8.44 | 2.60 | 22 |
| 04/29/91 | 15:06:16 | 11.11 | 8.39 | 2.65 | 23 |
| 04/30/91 | 15:06:16 | 11.16 | 8.34 | 2.70 | 24 |
| 05/01/91 | 15:06:16 | 11.17 | 8.33 | 2.71 | 25 |
| 05/02/91 | 15:06:16 | 11.04 | 8.46 | 2.58 | 26 |
| 05/03/91 | 15:06:16 | 10.86 | 8.64 | 2.40 | 27 |
| 05/04/91 | 15:06:16 | 10.76 | 8.74 | 2.30 | 28 |
| 05/05/91 | 15:06:16 | 10.88 | 8.62 | 2.42 | 29 |
| 05/06/91 | 15:06:16 | 10.11 | 9.39 | 1.65 | 30 |

*DTW = DEPTH TO WATER
 MSL = RELATIVE TO MEAN SEA LEVEL

APPENDIX I
Recovery Test Data.

RECOVERY METHOD ADAPTED FROM JACOB STRAIGHT LINE METHOD

Assumptions:

1. The water-bearing zone is uniform in character and the hydraulic conductivity is the same in all directions.
2. The zone is uniform in thickness and infinite in areal extent.
3. The formation receives no recharge from any source.
4. The well receives water from the full thickness of the water-bearing zone.
5. The water removed from storage is discharged instantaneously when the head is lowered.
6. The well is 100% efficient.
7. All water removed from the well comes from aquifer storage.
8. Laminar flow exists throughout the well and aquifer.
9. The water table has no slope.

Summary of Field Activities: -

1. Static ground-water level is measured prior to conducting the test.
2. Ground water is subsequently removed from the well for approximately one hour.
3. Drawdown of water-level is measured immediately after ground water withdrawal.
4. The drawdown of water-level is monitored at measured time intervals during recovery.

Review of Data Analysis:

1. The calculated water level recovery ($s-s_1$) is calculated based on an extrapolation of the time drawdown curve.
2. The calculated water level recovery is plotted against time on a logarithmic scale.
3. A best fit line was drawn.
3. The change in calculated recovery per log cycle (ΔS) is used to calculate transmissivity.
4. Well discharge rates (Q), which were measured in the field are obtained.

Equations:

Transmissivity (T):

$$T = \frac{264 Q}{\Delta S}$$

Where, T = Transmissivity (gallons/day/foot)

Q = Discharge from well (gallons/minute)

ΔS = Slope, recovery per unit time (minutes, using log scale, ratio 10)

Hydraulic Conductivity(K):

$$K = T / b$$

Where, K = Hydraulic Conductivity (gallons/day/foot²)

b = thickness of the water-bearing zone (feet)

T = Transmissivity (gallons/day/foot)

Calculations:

Calculations are provided on the following pages.

APPENDIX I-1

Recovery Test Method (Upper Water-Bearing Zone).

MONSANTO KEARNY CALCULATED RECOVERY DATA
 MONITORING WELL MW-7S
 CALCULATED RECOVERY CURVE METHOD

| TIME SINCE
WITHDRAWAL, t'
(minutes) | DTW*
(feet) | RESIDUAL
DRAWDOWN, s'
(feet) | EXTENDED
TIME
DRAWDOWN, s
(feet) | CALCULATED
RECOVERY(s-s')
(feet) |
|-------------------------------------------|----------------|------------------------------------|-------------------------------------------|----------------------------------------|
| 0.02 | 9.42 | 5.90 | 5.90 | 0.00 |
| 0.25 | 5.44 | 1.92 | 5.90 | 3.98 |
| 0.50 | 4.65 | 1.13 | 5.90 | 4.77 |
| 0.75 | 4.40 | 0.88 | 5.91 | 5.03 |
| 1.00 | 4.30 | 0.78 | 5.91 | 5.13 |
| 1.50 | 4.24 | 0.72 | 5.91 | 5.19 |
| 2.00 | 4.18 | 0.66 | 5.92 | 5.26 |
| 2.50 | 4.14 | 0.62 | 5.92 | 5.30 |
| 3.00 | 4.11 | 0.59 | 5.92 | 5.33 |
| 3.50 | 4.07 | 0.55 | 5.93 | 5.38 |
| 4.00 | 4.06 | 0.54 | 5.93 | 5.39 |
| 4.50 | 4.05 | 0.53 | 5.93 | 5.40 |
| 5.00 | 4.04 | 0.52 | 5.93 | 5.41 |
| 6.00 | 4.03 | 0.51 | 5.94 | 5.43 |
| 7.00 | 4.02 | 0.50 | 5.94 | 5.44 |
| 8.00 | 4.01 | 0.49 | 5.94 | 5.45 |
| 9.00 | 4.00 | 0.48 | 5.94 | 5.46 |
| 10.00 | 3.98 | 0.46 | 5.94 | 5.48 |
| 12.00 | 3.96 | 0.44 | 5.95 | 5.51 |
| 14.00 | 3.95 | 0.43 | 5.95 | 5.52 |

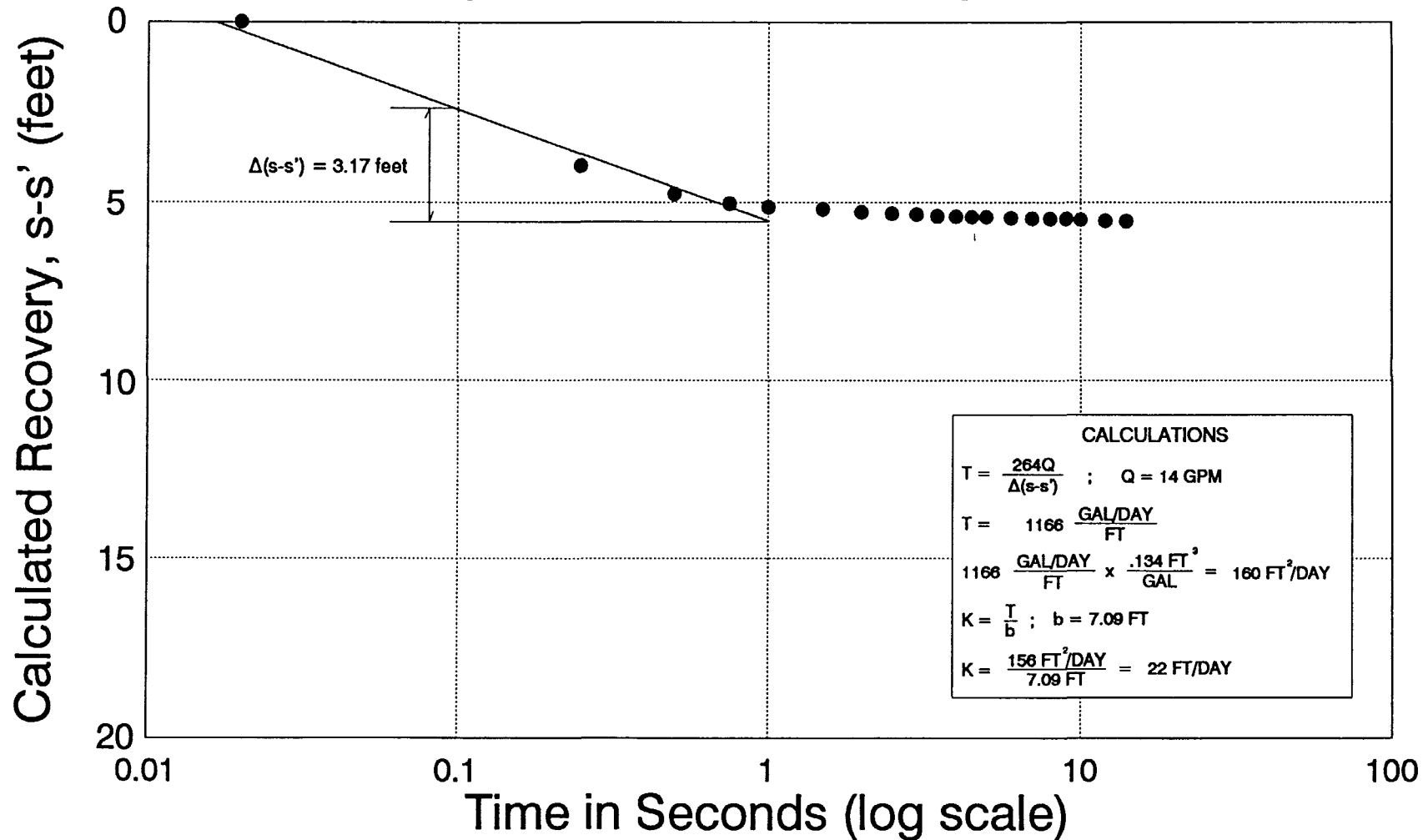
*DTW=Depth to Water.

Depth to static water prior to test, 3.52 feet.

Pumping rate=14 gallons per minute.

Calculated Recovery vs. Time

Recovery Test Data: Monitoring Well MW-7S



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MONSANTO KEARNY CALCULATED RECOVERY DATA
 MONITORING WELL MW-10S
 CALCULATED RECOVERY CURVE METHOD

| TIME SINCE
WITHDRAWAL,t'
(minutes) | DTW*
(feet) | RESIDUAL
DRAWDOWN,s'
(feet) | EXTENDED
TIME
DRAWDOWN, s
(feet) | CALCULATED
RECOVERY, s-s'
(feet) |
|------------------------------------------|----------------|-----------------------------------|-------------------------------------------|----------------------------------------|
| 0.02 | 16.19 | 10.52 | 10.52 | 0.00 |
| 0.25 | 8.13 | 2.46 | 10.52 | 8.06 |
| 0.50 | 7.55 | 1.88 | 10.52 | 8.64 |
| 0.75 | 7.11 | 1.44 | 10.55 | 9.11 |
| 1.00 | 6.55 | 0.88 | 10.61 | 9.73 |
| 1.50 | 6.35 | 0.68 | 10.61 | 9.93 |
| 2.00 | 6.15 | 0.48 | 10.62 | 10.14 |
| 2.50 | 6.00 | 0.33 | 10.63 | 10.30 |
| 3.00 | 5.90 | 0.23 | 10.66 | 10.43 |
| 3.50 | 5.84 | 0.17 | 10.69 | 10.52 |
| 4.00 | 5.80 | 0.13 | 10.71 | 10.58 |
| 4.50 | 5.77 | 0.10 | 10.73 | 10.63 |
| 5.00 | 5.75 | 0.08 | 10.78 | 10.70 |
| 6.00 | 5.72 | 0.05 | 10.83 | 10.78 |
| 7.00 | 5.71 | 0.04 | 10.93 | 10.89 |
| 8.00 | 5.70 | 0.03 | 10.98 | 10.95 |
| 9.00 | 5.69 | 0.02 | 10.98 | 10.96 |
| 10.00 | 5.68 | 0.01 | 11.03 | 11.02 |
| 11.00 | 5.67 | 0.00 | 11.08 | 11.08 |

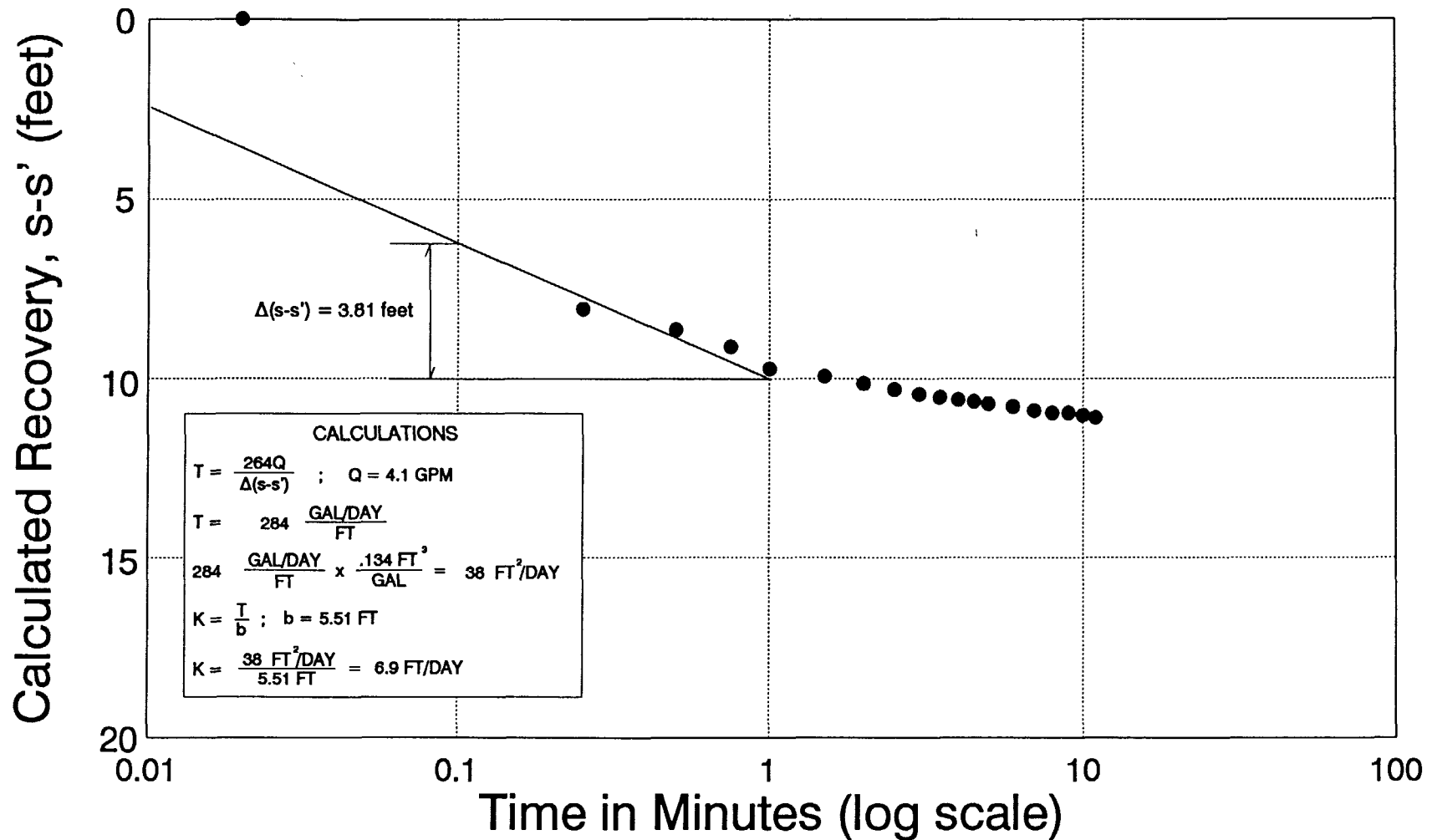
*DTW=Depth to water.

Depth to static water prior to test, 5.67.

Pumping rate=4.1 gallons per minute.

Calculated Recovery vs. Time

Recovery Test Data: Monitoring Well MW-10S



MONSANTO KEARNY CALCULATED RECOVERY DATA
 MONITORING WELL MW-11S
 CALCULATED RECOVERY CURVE METHOD

| TIME SINCE
WITHDRAWAL,t'
(minutes) | DTW*
(feet) | RESIDUAL
DRAWDOWN,s'
(feet) | EXTENDED
TIME
DRAWDOWN,s
(feet) | CALCULATED
RECOVERY(s-s')
(feet) |
|------------------------------------------|----------------|-----------------------------------|------------------------------------------|----------------------------------------|
| 0.02 | 13.87 | 9.99 | 9.99 | 0.00 |
| 0.25 | 8.00 | 4.12 | 9.99 | 5.87 |
| 0.50 | 7.48 | 3.60 | 9.99 | 6.39 |
| 0.75 | 7.02 | 3.14 | 10.00 | 6.86 |
| 1.00 | 6.47 | 2.59 | 10.00 | 7.41 |
| 1.50 | 5.71 | 1.83 | 10.01 | 8.18 |
| 2.00 | 5.20 | 1.32 | 10.01 | 8.69 |
| 2.50 | 4.85 | 0.97 | 10.02 | 9.05 |
| 3.00 | 4.63 | 0.75 | 10.02 | 9.27 |
| 3.50 | 4.40 | 0.52 | 10.03 | 9.51 |
| 4.00 | 4.34 | 0.46 | 10.03 | 9.57 |
| 4.50 | 4.24 | 0.36 | 10.04 | 9.68 |
| 5.00 | 4.17 | 0.29 | 10.04 | 9.75 |
| 6.00 | 4.10 | 0.22 | 10.05 | 9.83 |
| 7.00 | 4.05 | 0.17 | 10.05 | 9.88 |
| 8.00 | 4.01 | 0.13 | 10.06 | 9.93 |
| 9.00 | 3.98 | 0.10 | 10.06 | 9.96 |
| 10.00 | 3.97 | 0.09 | 10.07 | 9.98 |
| 13.00 | 3.96 | 0.08 | 10.08 | 10.00 |
| 20.00 | 3.93 | 0.05 | 10.12 | 10.07 |

*DTW=Depth to Water.

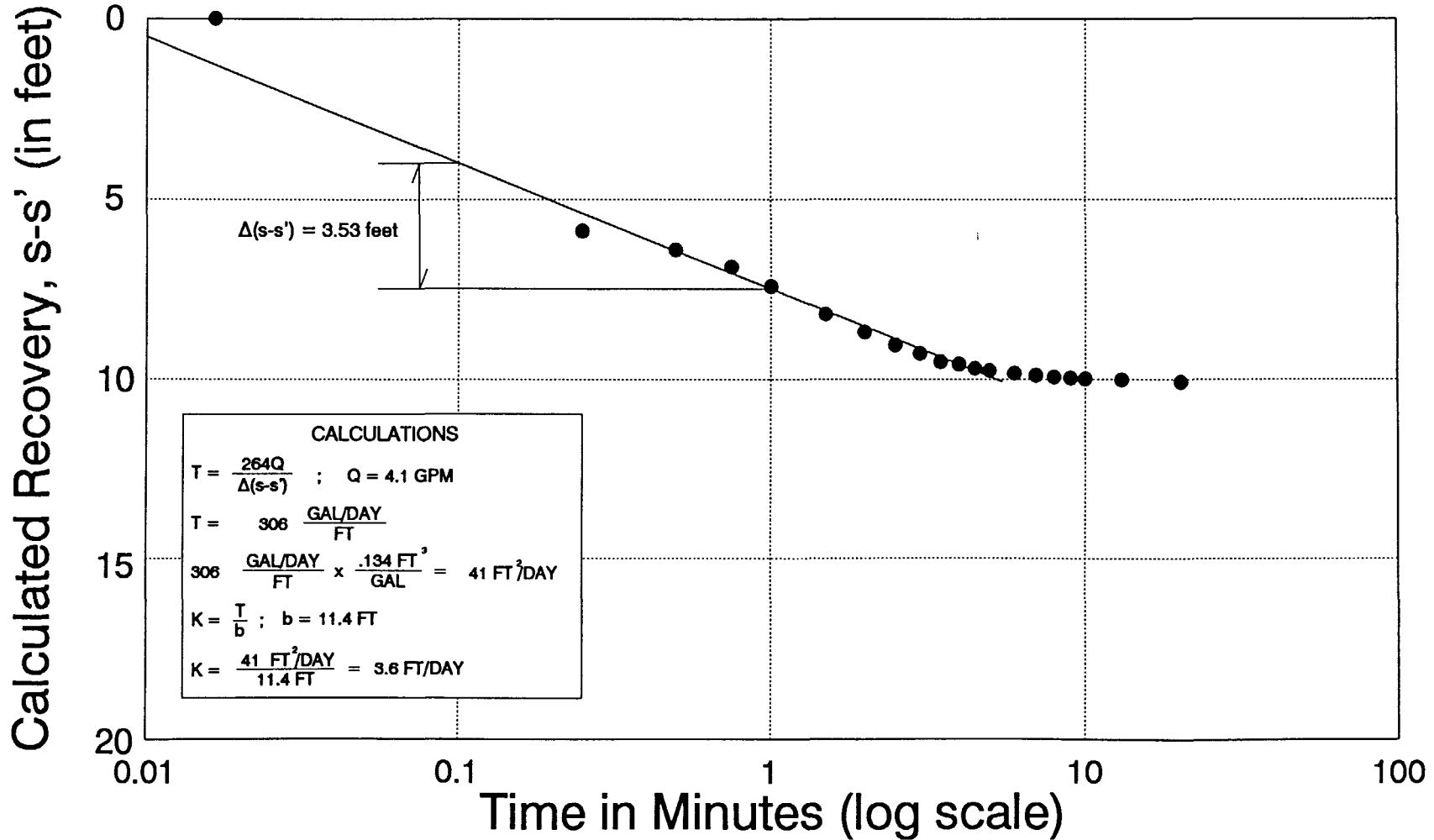
Depth to static water prior to test, 3.88 feet.

Pumping rate=4.1 gallons per minute.

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Calculated Recovery vs. Time

Monitoring Well MW-11S



APPENDIX I-2

Recovery Test Method (Lower Water-Bearing Zone).

MONSANTO KEARNY CALCULATED RECOVERY DATA
 MONITORING WELL MW-10D
 CALCULATED RECOVERY CURVE METHOD

| TIME SINCE
WITHDRAWAL,t'
(minutes) | DTW*
(feet) | RESIDUAL
DRAWDOWN,s'
(feet) | EXTENDED
TIME
DRAWDOWN,s
(feet) | CALCULATED
RECOVERY,(s-s')
(feet) |
|------------------------------------------|----------------|-----------------------------------|------------------------------------------|-----------------------------------------|
| 0.02 | 18.95 | 9.28 | 9.28 | 0.00 |
| 0.25 | 17.90 | 8.23 | 9.28 | 1.05 |
| 0.50 | 12.11 | 2.44 | 9.28 | 6.84 |
| 0.75 | 11.24 | 1.57 | 9.28 | 7.71 |
| 1.00 | 10.98 | 1.31 | 9.28 | 7.97 |
| 1.50 | 10.82 | 1.15 | 9.28 | 8.13 |
| 2.00 | 10.70 | 1.03 | 9.28 | 8.25 |
| 2.50 | 10.63 | 0.96 | 9.28 | 8.32 |
| 3.00 | 10.58 | 0.91 | 9.28 | 8.37 |
| 3.50 | 10.55 | 0.88 | 9.28 | 8.40 |
| 4.00 | 10.51 | 0.84 | 9.28 | 8.44 |
| 4.50 | 10.48 | 0.81 | 9.28 | 8.47 |
| 5.00 | 10.46 | 0.79 | 9.29 | 8.50 |
| 6.00 | 10.44 | 0.77 | 9.29 | 8.52 |
| 7.00 | 10.40 | 0.73 | 9.29 | 8.56 |
| 8.00 | 10.35 | 0.68 | 9.29 | 8.61 |
| 9.00 | 10.31 | 0.64 | 9.29 | 8.65 |
| 10.00 | 10.30 | 0.63 | 9.29 | 8.66 |
| 15.00 | 10.28 | 0.61 | 9.31 | 8.70 |
| 20.00 | 10.21 | 0.54 | 9.31 | 8.77 |
| 25.00 | 10.14 | 0.47 | 9.33 | 8.86 |
| 30.00 | 10.13 | 0.46 | 9.33 | 8.87 |

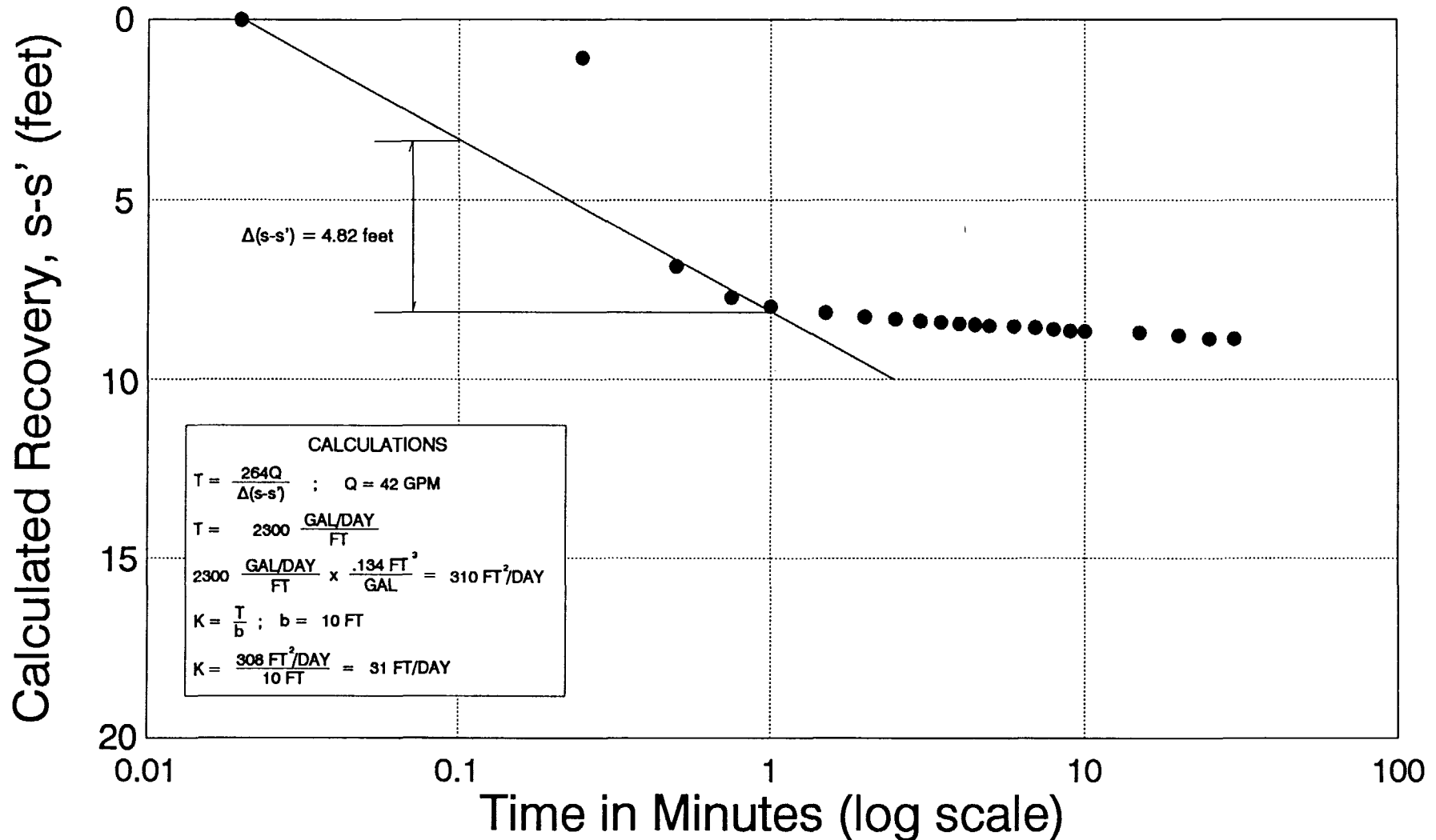
*DTW=Depth to water.

Depth to static water level prior to test, 9.67 feet.

Pumping rate=35 gallons per minute.

Calculated Recovery vs. Time

Recovery Test Data: Monitoring Well MW-10D



MONSANTO KEARNY CALCULATED RECOVERY DATA
 MONITORING WELL MW-11D
 CALCULATED RECOVERY CURVE METHOD

| TIME SINCE
WITHDRAWAL,t'
(minutes) | DTW*
(feet) | RESIDUAL
DRAWDOWN,s'
(feet) | EXTENDED
TIME
DRAWDOWN,s
(feet) | CALCULATED
RECOVERY(s-s')
(feet) |
|------------------------------------------|----------------|-----------------------------------|------------------------------------------|----------------------------------------|
| 0.02 | 28.20 | 19.30 | 19.30 | 0.00 |
| 0.25 | 18.55 | 9.65 | 19.30 | 9.65 |
| 0.50 | 13.10 | 4.20 | 19.30 | 15.10 |
| 0.75 | 10.64 | 1.74 | 19.30 | 17.56 |
| 1.00 | 10.10 | 1.20 | 19.30 | 18.10 |
| 1.50 | 9.87 | 0.97 | 19.30 | 18.33 |
| 2.00 | 9.75 | 0.85 | 19.30 | 18.45 |
| 2.50 | 9.68 | 0.78 | 19.30 | 18.52 |
| 3.00 | 9.63 | 0.73 | 19.30 | 18.57 |
| 3.50 | 9.59 | 0.69 | 19.30 | 18.61 |
| 4.00 | 9.55 | 0.65 | 19.30 | 18.65 |
| 4.50 | 9.52 | 0.62 | 19.30 | 18.68 |
| 5.00 | 9.49 | 0.59 | 19.31 | 18.72 |
| 6.00 | 9.46 | 0.56 | 19.31 | 18.75 |
| 7.00 | 9.41 | 0.51 | 19.31 | 18.80 |
| 8.00 | 9.38 | 0.48 | 19.31 | 18.83 |
| 9.00 | 9.32 | 0.42 | 19.31 | 18.89 |
| 10.00 | 9.28 | 0.38 | 19.31 | 18.93 |
| 12.00 | 9.26 | 0.36 | 19.31 | 18.95 |
| 14.00 | 9.24 | 0.34 | 19.32 | 18.98 |
| 16.00 | 9.20 | 0.30 | 19.32 | 19.02 |
| 18.00 | 9.15 | 0.25 | 19.32 | 19.07 |
| 20.00 | 9.10 | 0.20 | 19.32 | 19.12 |
| 25.00 | 9.07 | 0.17 | 19.33 | 19.16 |
| 30.00 | 9.05 | 0.15 | 19.33 | 19.18 |

*DTW=Depth to water.

Depth to static water prior to test, 8.90 feet.

Pumping rate=32 gallons per minute

Calculated Recovery vs. Time

Recovery Test Data: Monitoring Well MW-11D

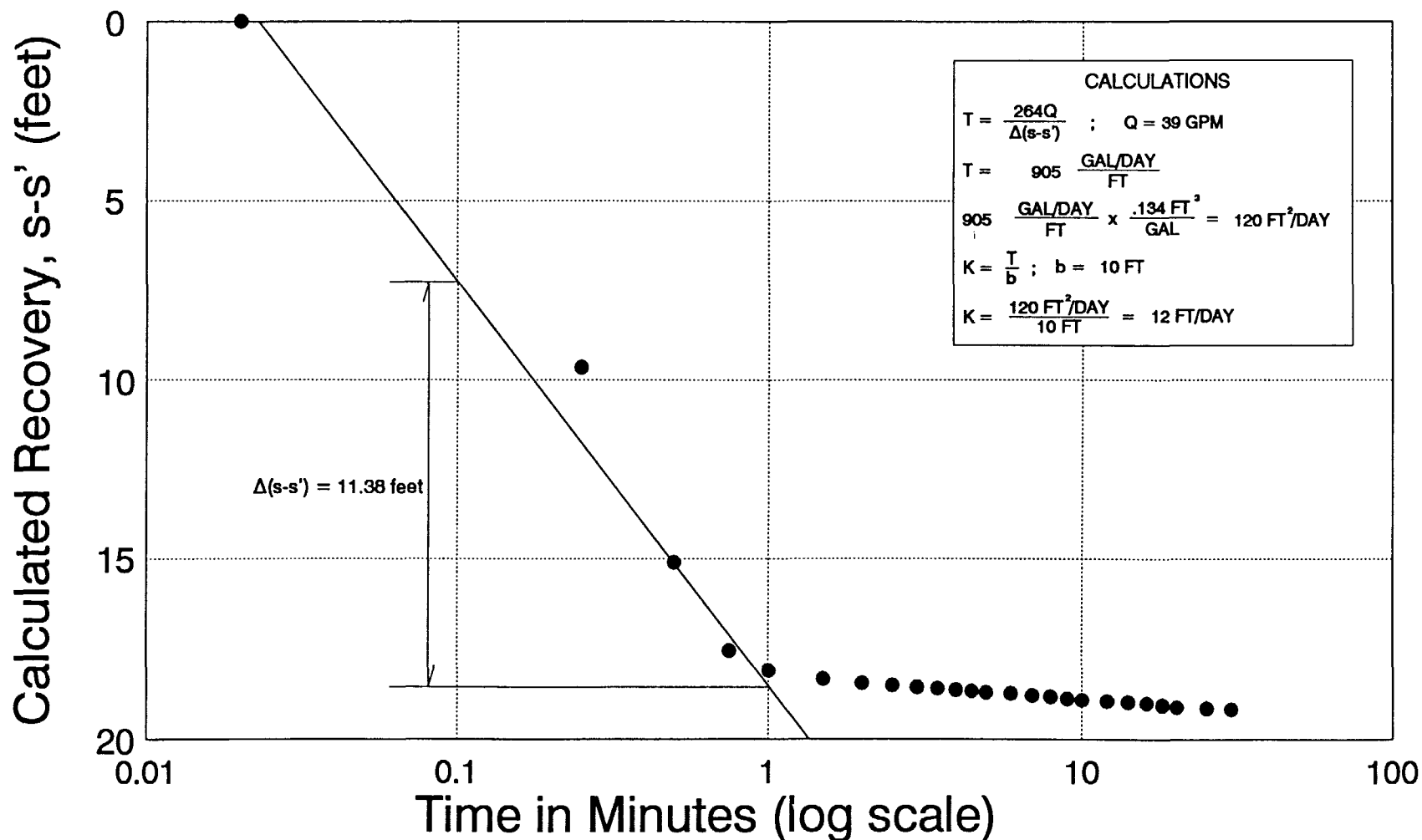


Exhibit C

3

**PRELIMINARY REMEDIAL INVESTIGATION REPORT
Volume III of III**

MONSANTO KEARNY PLANT
Kearny, New Jersey

August 30, 1991

Prepared for:

MONSANTO COMPANY
Kearny, New Jersey

Prepared by:

ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066



APPENDIX J

Well Sampling Data Forms.

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 1-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 5:45

SAMPLED BY: E. Risha, J. Ix

TIME OF FINISH: 6:05

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 4.17 FT.

WATER COLUMN: 7.83 FT.

VOLUME OF WATER IN WELL: 5.09 GAL.

VOLUME OF WATER TO REMOVE: 15.27 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling.

FIELD MEASUREMENTS:

TIME: 18:15

pH: 5.25

COND: 8,500 micro OHMS

TEMP: 17°C

TURB: 19 NTU

Eh: +220 mV

O₂: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130738

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 3-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 11:50

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 12:10

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 4.79 FT.

WATER COLUMN: 7.21 FT.

VOLUME OF WATER IN WELL: 4.69 GAL.

VOLUME OF WATER TO REMOVE: 14.07 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging and sampling.

FIELD MEASUREMENTS:

TIME: 12:33

pH: 5.41

COND: 2,050 micro OHMS

TEMP: 21°C

TURB: 20 NTU

Eh: +250 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130739

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 3-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 11:45

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 12:15

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>31.00</u> | FT. |
| DEPTH TO WATER: | <u>9.07</u> | FT. |
| WATER COLUMN: | <u>22.03</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>14.32</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>42.96</u> | GAL. |
| VOLUME REMOVED: | <u>60.00</u> | GAL. |

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling. Water had amber color during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>12:50</u> |
| pH: | <u>5.45</u> |
| COND: | <u>6,900 micro OHMS</u> |
| TEMP: | <u>18°C</u> |
| TURB: | <u>29 NTU</u> |
| Eh: | <u>+300 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tai-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130740

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 4-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 13:20

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 13:36

DEPTH TO BOTTOM OF WELL: 12.30 FT.

DEPTH TO WATER: 5.72 FT.

WATER COLUMN: 6.58 FT.

VOLUME OF WATER IN WELL: 4.28 GAL.

VOLUME OF WATER TO REMOVE: 12.84 GAL.

VOLUME REMOVED: 16.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

FIELD MEASUREMENTS:

TIME: 14:56

pH: 5.20

COND: 1,500 micro OHMS

TEMP: 16°C

TURB: 23 NTU

Eh: +120 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130741

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 5-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 13:40

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 13:55

DEPTH TO BOTTOM OF WELL: 12.50 FT.

DEPTH TO WATER: 6.45 FT.

WATER COLUMN: 6.05 FT.

VOLUME OF WATER IN WELL: 3.93 GAL.

VOLUME OF WATER TO REMOVE: 11.80 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling.

FIELD MEASUREMENTS:

TIME: 15:30

pH: 5.25

COND: 1.900 micro OHMS

TEMP: 19°C

TURB: 71 NTU

Eh: +95 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tail-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130742

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 6-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/11/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 15:20

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:45

DEPTH TO BOTTOM OF WELL: 12.65 FT.

DEPTH TO WATER: 6.08 FT.

WATER COLUMN: 6.57 FT.

VOLUME OF WATER IN WELL: 4.30 GAL

VOLUME OF WATER TO REMOVE: 12.90 GAL

VOLUME REMOVED: 20.00 GAL

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Rust color during purging.

FIELD MEASUREMENTS:

TIME: 17:34

pH: 7.80

COND: 4.350 micro OHMS

TEMP: 16°C

TURB: 70 NTU

Eh: +220 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130743

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 6-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/20/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 14:20

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:00

DEPTH TO BOTTOM OF WELL: 28.20 FT.

DEPTH TO WATER: 9.47 FT.

WATER COLUMN: 18.73 FT.

VOLUME OF WATER IN WELL: 12.18 GAL

VOLUME OF WATER TO REMOVE: 36.54 GAL

VOLUME REMOVED: 80.00 GAL

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odor during gauging, purging or sampling. Matrix spike and matrix spike duplicates obtained during sampling this well.

FIELD MEASUREMENTS:

TIME: 16:51

pH: 7.36

COND: 5.300 micro OHMS

TEMP: 15°C

TURB: 34 NTU

Eh: +240 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130744

MO06606J.2.28 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 7-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 09:55

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 10:15

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 4.25 FT.

WATER COLUMN: 7.75 FT.

VOLUME OF WATER IN WELL: 5.04 GAL.

VOLUME OF WATER TO REMOVE: 15.12 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging. Hydrocarbon odor during purging and sampling.

FIELD MEASUREMENTS:

TIME: 11:33

pH: 4.55

COND: 2.030 micro OHMS

TEMP: 19.5°C

TURB: 51 NTU

Eh: +20 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130745

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 7-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 10:00

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 10:25

DEPTH TO BOTTOM OF WELL: 27.20 FT.

DEPTH TO WATER: 8.91 FT.

WATER COLUMN: 18.29 FT.

VOLUME OF WATER IN WELL: 11.90 GAL.

VOLUME OF WATER TO REMOVE: 35.60 GAL.

VOLUME REMOVED: 50.00 GAL.

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

FIELD MEASUREMENTS:

TIME: 11:54

pH: 5.70

COND: 5,780 micro OHMS

TEMP: 19.5°C

TURB: 80 NTU

Eh: +60 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130746

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 8-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/11/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 15:00

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:20

| | | |
|----------------------------|-------------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>6.65</u> | FT. |
| WATER COLUMN: | <u>5.35</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>3.50</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>10.50</u> | GAL. |
| VOLUME REMOVED: | <u>> 16.00</u> | GAL. |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

No odors during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>15:50</u> |
| pH: | <u>7.60</u> |
| COND: | <u>3,100 micro OHMS</u> |
| TEMP: | <u>18°C</u> |
| TURB: | <u>25 NTU</u> |
| Eh: | <u>+280 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130747

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 8-D

TYPE OF WELL: Monitoring Well

DATE: 06-11-90

STORAGE TANK: --

WEATHER: 65° F: Partly Cloudy

TIME OF START: 0847

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 0910

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>27.70</u> | FT. |
| DEPTH TO WATER: | <u>8.30</u> | FT. |
| WATER COLUMN: | <u>19.40</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>12.61</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>37.83</u> | GAL. |
| VOLUME REMOVED: | <u>46.00</u> | GAL. |

RATE OF PURGE: 2 GPM

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging and sampling

FIELD MEASUREMENTS:

| | |
|------------------|-----------------------------|
| TIME: | <u>14:25 hrs</u> |
| pH: | <u>7.20</u> |
| COND: | <u>6.300 micro ohms</u> |
| TEMP: | <u>17° C</u> |
| TURB: | <u>41 ntu</u> |
| Eh: | <u>+71 mV</u> |
| O ² : | <u> </u> |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130748

MO06606J.5.7 10.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 9-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 11:00

SAMPLED BY: J. Ix, E. Risha

TIME OF FINISH: 11:10

| | | |
|----------------------------|--------------|-------------|
| DEPTH TO BOTTOM OF WELL: | <u>16.60</u> | <u>FT.</u> |
| DEPTH TO WATER: | <u>5.04</u> | <u>FT.</u> |
| WATER COLUMN: | <u>11.56</u> | <u>FT.</u> |
| VOLUME OF WATER IN WELL: | <u>7.50</u> | <u>GAL.</u> |
| VOLUME OF WATER TO REMOVE: | <u>22.50</u> | <u>GAL.</u> |
| VOLUME REMOVED: | <u>8.00</u> | <u>GAL.</u> |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

One well volume removed, this well had very poor recovery during development.

FIELD MEASUREMENTS:

TIME: 16:15
pH: 5.75
COND: 2,800 micro OHMS
TEMP: 16°C
TURB: 38 NTU
Eh: +220 mV
O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130749

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 9-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 14:30

SAMPLED BY: J. Ix, E. Risha

TIME OF FINISH: 14:45

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>25.10</u> | FT. |
| DEPTH TO WATER: | <u>7.15</u> | FT. |
| WATER COLUMN: | <u>17.95</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>11.70</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>35.00</u> | GAL. |
| VOLUME REMOVED: | <u>50.00</u> | GAL. |

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>16:30</u> |
| pH: | <u>5.30</u> |
| COND: | <u>5.970 micro OHMS</u> |
| TEMP: | <u>18°C</u> |
| TURB: | <u>29 NTU</u> |
| Eh: | <u>+245 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130750

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 10-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 12:34

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 13:00

DEPTH TO BOTTOM OF WELL: 15.60 FT.

DEPTH TO WATER: 5.86 FT.

WATER COLUMN: 9.74 FT.

VOLUME OF WATER IN WELL: 6.30 GAL

VOLUME OF WATER TO REMOVE: 19.00 GAL

VOLUME REMOVED: 24.00 GAL

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

None.

FIELD MEASUREMENTS:

TIME: 13:57

pH: 6.00

COND: 2.000 micro OHMS

TEMP: 16.5°C

TURB: 19 NTU

Eh: +200 mV

O₂: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130751

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 10-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 12:55

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 13:08

DEPTH TO BOTTOM OF WELL: 29.40 FT.

DEPTH TO WATER: 9.60 FT.

WATER COLUMN: 19.80 FT.

VOLUME OF WATER IN WELL: 12.87 GAL.

VOLUME OF WATER TO REMOVE: 38.60 GAL.

VOLUME REMOVED: 50.00 GAL.

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Ground water had a yellow-amber color during purging and sampling.

FIELD MEASUREMENTS:

TIME: 15:41

pH: 5.83

COND: 5.160 micro OHMS

TEMP: 16°C

TURB: 29 NTU

Eh: +240 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130752

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 11-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 10:40

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 11:00

DEPTH TO BOTTOM OF WELL: 15.50 FT.

DEPTH TO WATER: 4.54 FT.

WATER COLUMN: 10.96 FT.

VOLUME OF WATER IN WELL: 7.12 GAL

VOLUME OF WATER TO REMOVE: 21.40 GAL

VOLUME REMOVED: 24.00 GAL

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Hydrocarbon odors present during gauging, purging and sampling.

FIELD MEASUREMENTS:

TIME: 12:55

pH: 5.00

COND: 2.000 micro OHMS

TEMP: 18°C

TURB: 26 NTU

Eh: +200 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130753

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 11-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 11:55

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 12:08

DEPTH TO BOTTOM OF WELL: 29.40 FT.

DEPTH TO WATER: 9.16 FT.

WATER COLUMN: 20.24 FT.

VOLUME OF WATER IN WELL: 13.16 GAL.

VOLUME OF WATER TO REMOVE: 39.50 GAL.

VOLUME REMOVED: 50.00 GAL.

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging and sampling. Ground water amber-colored.

FIELD MEASUREMENTS:

TIME: 13:15

pH: 4.50

COND: 5,900 micro OHMS

TEMP: 18°C

TURB: 45 NTU

Eh: +260 mV

O₂: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130754

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 12-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 10:15

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 10:43

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>15.50</u> | FT. |
| DEPTH TO WATER: | <u>4.75</u> | FT. |
| WATER COLUMN: | <u>10.75</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>6.98</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>21.00</u> | GAL. |
| VOLUME REMOVED: | <u>28.00</u> | GAL. |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

No odor during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>11:53</u> |
| pH: | <u>5.23</u> |
| COND: | <u>2,230 micro OHMS</u> |
| TEMP: | <u>22°C</u> |
| TURB: | <u>55 NTU</u> |
| Eh: | <u>+240 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130755

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 12-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/13/90

STORAGE TANK: _____

WEATHER: Sunny, 70°F

TIME OF START: 10:05

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 10:18

DEPTH TO BOTTOM OF WELL: 28.80 FT.

DEPTH TO WATER: 9.35 FT.

WATER COLUMN: 19.45 FT.

VOLUME OF WATER IN WELL: 12.64 GAL

VOLUME OF WATER TO REMOVE: 38.00 GAL

VOLUME REMOVED: 50.00 GAL

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling. Ground-water was yellow in color.

FIELD MEASUREMENTS:

TIME: 12:21
pH: 4.90
COND: 6.530 micro OHMS
TEMP: 20°C
TURB: 17 NTU
Eh: +230 mV
O₂: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals (total and dissolved), Total Cyanide, Alkalinity, Ammonia, Ammonium, Chloride, Fluoride, Nitrite, Nitrate, Nitrogen, Phosphate, Dissolved Silica, Sulfate, Total Dissolved Solids, Total Suspended Solids.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130756

MO06606J.2.27 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto
PROJECT NO.: 06606J
LOCATION: Kearny, NJ

WELL NUMBER: 13-S
DATE: 6/11/90
WEATHER: Partly cloudy, 65°F
SAMPLED BY: J. Powley, J. Ix

TYPE OF WELL: PVC-Monitoring Well
STORAGE TANK: _____
TIME OF START: 11:20
TIME OF FINISH: 11:50

| | | |
|----------------------------|--------------|-----|
| DEPTH TO BOTTOM OF WELL: | <u>12.50</u> | FT. |
| DEPTH TO WATER: | <u>4.79</u> | FT. |
| WATER COLUMN: | <u>7.71</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>5.01</u> | GAL |
| VOLUME OF WATER TO REMOVE: | <u>15.03</u> | GAL |
| VOLUME REMOVED: | <u>17.00</u> | GAL |

RATE OF PURGE: 1 gpm
METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Rust color noted during gauging, purging and sampling. Slight hydrocarbon odor noted during sampling.

FIELD MEASUREMENTS:

TIME: 13:53
pH: 7.20
COND: 1,500 micro OHMS
TEMP: 18°C
TURB: 29 NTU
Eh: +40 mV
O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130757

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 13-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/11/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 15:32

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:54

| | | |
|----------------------------|---------------|-----|
| DEPTH TO BOTTOM OF WELL: | <u>25.20</u> | FT. |
| DEPTH TO WATER: | <u>9.04</u> | FT. |
| WATER COLUMN: | <u>16.16</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>10.50</u> | GAL |
| VOLUME OF WATER TO REMOVE: | <u>31.50</u> | GAL |
| VOLUME REMOVED: | <u>100.00</u> | GAL |

RATE OF PURGE: 4.5 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Rust color to water during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>18:00</u> |
| pH: | <u>7.9</u> |
| COND: | <u>6.330 micro OHMS</u> |
| TEMP: | <u>15°C</u> |
| TURB: | <u>66 NTU</u> |
| Eh: | <u>+230 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130758

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 14-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/11/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 10:53

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 11:22

DEPTH TO BOTTOM OF WELL: 12.90 FT.

DEPTH TO WATER: 5.03 FT.

WATER COLUMN: 7.87 FT.

VOLUME OF WATER IN WELL: 5.12 GAL

VOLUME OF WATER TO REMOVE: 15.36 GAL

VOLUME REMOVED: >16.00 GAL

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging and sampling.

FIELD MEASUREMENTS:

TIME: 13:21

pH: 6.80

COND: 2,150 micro OHMS

TEMP: 17°C

TURB: 25 NTU

Eh: +260 mV

O²: _____

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130759

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 14-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/11/90

STORAGE TANK: _____

WEATHER: Partly cloudy, 65°F

TIME OF START: 12:05

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 12:45

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>28.00</u> | FT. |
| DEPTH TO WATER: | <u>9.05</u> | FT. |
| WATER COLUMN: | <u>18.96</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>12.30</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>36.90</u> | GAL. |
| VOLUME REMOVED: | <u>80.00</u> | GAL. |

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odor during gauging, purging or sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>14:45</u> |
| pH: | <u>7.50</u> |
| COND: | <u>8,400 micro OHMS</u> |
| TEMP: | <u>17°C</u> |
| TURB: | <u>37 NTU</u> |
| Eh: | <u>+280 mV</u> |
| O ₂ : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL-Volatiles, TCL-Semi-Volatiles, PCBs, TAL-Metals, Total Cyanide.

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130760

MO06606J.2.26 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 15-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 15:30

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 16:00

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>14.50</u> | FT. |
| DEPTH TO WATER: | <u>2.23</u> | FT. |
| WATER COLUMN: | <u>12.27</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>7.96</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>23.88</u> | GAL. |
| VOLUME REMOVED: | <u>30.00</u> | GAL. |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand-bailing

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>16:45</u> |
| pH: | <u>5.40</u> |
| COND: | <u>2,200 micro OHMS</u> |
| TEMP: | <u>17°C</u> |
| TURB: | <u>30 NTU</u> |
| Eh: | <u>+140 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130761

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 15-D

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 15:20

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:50

| | | |
|----------------------------|--------------|-----|
| DEPTH TO BOTTOM OF WELL: | <u>28.50</u> | FT. |
| DEPTH TO WATER: | <u>6.75</u> | FT. |
| WATER COLUMN: | <u>21.75</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>14.14</u> | GAL |
| VOLUME OF WATER TO REMOVE: | <u>42.42</u> | GAL |
| VOLUME REMOVED: | <u>60.00</u> | GAL |

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

No odors during gauging, purging or sampling. Water had amber color during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>16:15</u> |
| pH: | <u>4.90</u> |
| COND: | <u>5,700 micro OHMS</u> |
| TEMP: | <u>17°C</u> |
| TURB: | <u>50 NTU</u> |
| Eh: | <u>+180 mV</u> |
| O ² : | _____ |

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130762

MO06606J.2.25 6.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny, NJ

WELL NUMBER: 16-S

TYPE OF WELL: PVC-Monitoring Well

DATE: 6/12/90

STORAGE TANK: _____

WEATHER: Sunny, Windy

TIME OF START: 15:00

SAMPLED BY: J. Powley, J. Ix

TIME OF FINISH: 15:30

| | | |
|----------------------------|--------------|-------------|
| DEPTH TO BOTTOM OF WELL: | <u>16.00</u> | <u>FT.</u> |
| DEPTH TO WATER: | <u>5.98</u> | <u>FT.</u> |
| WATER COLUMN: | <u>10.02</u> | <u>FT.</u> |
| VOLUME OF WATER IN WELL: | <u>6.51</u> | <u>GAL.</u> |
| VOLUME OF WATER TO REMOVE: | <u>19.54</u> | <u>GAL.</u> |
| VOLUME REMOVED: | <u>30.00</u> | <u>GAL.</u> |

RATE OF PURGE: 2 gpm

METHOD OF PURGE: Above-ground pump

PHYSICAL APPEARANCE/COMMENTS:

Hydrocarbon odor during purging and sampling.

FIELD MEASUREMENTS:

| | |
|------------------|-----------------------------|
| TIME: | <u>15:45</u> |
| pH: | <u>5.70</u> |
| COND: | <u>1,800 micro OHMS</u> |
| TEMP: | <u>18°C</u> |
| TURB: | <u>54 NTU</u> |
| Eh: | <u>+110 mV</u> |
| O ₂ : | <u> </u> |

TYPES OF SAMPLES COLLECTED:

TCL - Volatiles, TCL-Semi-Volatiles, PCBs, Tal-Metals, Total Cyanide

LABORATORY NAME & LOCATION:

Enseco East, Somerset, NJ

850130763

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-1S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70 ° F: Cloudy

TIME OF START: 1600

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1625

DEPTH TO BOTTOM OF WELL: 12.83 FT.

DEPTH TO WATER: 4.22 FT.

WATER COLUMN: 8.61 FT.

VOLUME OF WATER IN WELL: 5.60 GAL.

VOLUME OF WATER TO REMOVE: 16.80 GAL.

VOLUME REMOVED: 23.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand Bailed

PHYSICAL APPEARANCE/COMMENTS:

Dark amber color with hydrogen sulfide odor

FIELD MEASUREMENTS:

TIME: 1640

pH: 7.27 su

COND: 7.27 millisiemens

TEMP: 21 ° C

TURB: N14

Eh: +195 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-1S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130764

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-3S

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 0955

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1004

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>15.00</u> | FT. |
| DEPTH TO WATER: | <u>5.16</u> | FT. |
| WATER COLUMN: | <u>9.84</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>6.40</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>19.20</u> | GAL. |
| VOLUME REMOVED: | <u>35.00</u> | GAL. |

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1130</u> |
| pH: | <u>5.99</u> |
| COND: | <u>545 microsiemens</u> |
| TEMP: | <u>23°C</u> |
| TURB: | <u>N/A</u> |
| Eh: | <u>+190 mV</u> |
| O ₂ : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-3S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130765

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-3D

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 1009

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1016

DEPTH TO BOTTOM OF WELL: 30.85 FT.

DEPTH TO WATER: 9.01 FT.

WATER COLUMN: 21.84 FT.

VOLUME OF WATER IN WELL: 14.20 GAL.

VOLUME OF WATER TO REMOVE: 42.60 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Organic Odor

FIELD MEASUREMENTS:

TIME: 1145

pH: 6.58 su

COND: 6.65 millisiemens

TEMP: 20 °C

TURB: N/A

Eh: +200 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs +15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-3D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130766

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-4S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: ° F: Cloudy

TIME OF START: 1335

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1342

| | | |
|----------------------------|--------------|-----|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>5.39</u> | FT. |
| WATER COLUMN: | <u>6.61</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>4.30</u> | GAL |
| VOLUME OF WATER TO REMOVE: | <u>12.90</u> | GAL |
| VOLUME REMOVED: | <u>20.00</u> | GAL |

RATE OF PURGE: 3 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1530</u> |
| pH: | <u>6.30 su</u> |
| COND: | <u>443 microsiemens</u> |
| TEMP: | <u>22°C</u> |
| TURB: | <u>N/A</u> |
| Eh: | <u>+195 mV</u> |
| O ² : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-4S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130767

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-5S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70 ° F: Cloudy

TIME OF START: 1020

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1026

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 6.57 FT.

WATER COLUMN: 5.43 FT.

VOLUME OF WATER IN WELL: 3.53 GAL.

VOLUME OF WATER TO REMOVE: 10.59 GAL.

VOLUME REMOVED: 18.00 GAL.

RATE OF PURGE: 3 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Turbid at start of purging

FIELD MEASUREMENTS:

TIME: 1145

pH: 6.76 su

COND: 1.11 millisiemens

TEMP: 22 °C

TURB: 44 NTU

Eh: +210 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-5S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130768

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-6S

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 1430

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1450

| | | |
|----------------------------|--------------|-------------|
| DEPTH TO BOTTOM OF WELL: | <u>12.60</u> | <u>FT.</u> |
| DEPTH TO WATER: | <u>6.25</u> | <u>FT.</u> |
| WATER COLUMN: | <u>6.35</u> | <u>FT.</u> |
| VOLUME OF WATER IN WELL: | <u>4.13</u> | <u>GAL.</u> |
| VOLUME OF WATER TO REMOVE: | <u>12.39</u> | <u>GAL.</u> |
| VOLUME REMOVED: | <u>20.00</u> | <u>GAL.</u> |

RATE OF PURGE: N/A

METHOD OF PURGE: Hand Bailing

PHYSICAL APPEARANCE/COMMENTS:

Turbid

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1500</u> |
| pH: | <u>6.45 su</u> |
| COND: | <u>0.53 millisiemens</u> |
| TEMP: | <u>22 °C</u> |
| TURB: | <u>N/A</u> |
| Eh: | <u>+210 mV</u> |
| O ² : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample IS# P2-6S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130769

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-6D

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F. Cloudy

TIME OF START: 0945

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 0950

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 9.32 FT.

WATER COLUMN: 20.68 FT.

VOLUME OF WATER IN WELL: 13.44 GAL.

VOLUME OF WATER TO REMOVE: 40.32 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 15 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Turbid at start of purging

FIELD MEASUREMENTS:

TIME: 1130

pH: 6.85 su

COND: 4.58 millisiemens

TEMP: 18 °C

TURB: 40 NTU

Eh: +225 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-6D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130770

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-7S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70 ° F: Cloudy

TIME OF START: 0935

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 0941

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>4.41</u> | FT. |
| WATER COLUMN: | <u>7.59</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>4.93</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>14.79</u> | GAL. |
| VOLUME REMOVED: | <u>30.00</u> | GAL. |

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1045</u> |
| pH: | <u>6.39 su</u> |
| COND: | <u>335 microsiemens</u> |
| TEMP: | <u>23 °C</u> |
| TURB: | <u>29 NTU</u> |
| Eh: | <u>+200 mV</u> |
| O ² : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-7S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130771

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-7D

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F: Cloudy

TIME OF START: 0935

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 0945

DEPTH TO BOTTOM OF WELL: 29.50 FT.

DEPTH TO WATER: 8.70 FT.

WATER COLUMN: 20.80 FT.

VOLUME OF WATER IN WELL: 13.52 GAL.

VOLUME OF WATER TO REMOVE: 40.56 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slight organic odor

FIELD MEASUREMENTS:

TIME: 1100

pH: 6.34 su

COND: 5.08 millisiemens

TEMP: 20 °C

TURB: 43 NTU

Eh: +230 Mv

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-7D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130772

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-8S

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F: Cloudy

TIME OF START: 1030

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1045

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 6.39 FT.

WATER COLUMN: 5.61 FT.

VOLUME OF WATER IN WELL: 3.65 GAL.

VOLUME OF WATER TO REMOVE: 10.94 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Slow recharge

FIELD MEASUREMENTS:

TIME: 1230

pH: 6.10 su

COND: 2.00 millisiemens

TEMP: 22°C

TURB: 37 NTU

Eh: +230 mV

O₂: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-8S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130773

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-8D

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F: Cloudy

TIME OF START: 1030

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1044

DEPTH TO BOTTOM OF WELL: 29.00 FT.

DEPTH TO WATER: 7.82 FT.

WATER COLUMN: 21.18 FT.

VOLUME OF WATER IN WELL: 13.78 GAL.

VOLUME OF WATER TO REMOVE: 41.34 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slight organic odor

FIELD MEASUREMENTS:

TIME: 1130

pH: 5.79 su

COND: 6.41 millisiemens

TEMP: 19.5 °C

TURB: 24 NTU

Eh: +240 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-8D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130774

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-9S

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 1530

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1555

DEPTH TO BOTTOM OF WELL: 16.00 FT.

DEPTH TO WATER: 5.19 FT.

WATER COLUMN: 10.81 FT.

VOLUME OF WATER IN WELL: 7.03 GAL.

VOLUME OF WATER TO REMOVE: 21.09 GAL.

VOLUME REMOVED: 25.00 GAL.

RATE OF PURGE: N/A

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Slow recharge

FIELD MEASUREMENTS:

TIME: 1614

pH: 6.37 su

COND: 1.09 millisiemens

TEMP: 22½ C

TURB: N/A

Eh: +225 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-9S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130775

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-9D

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 1540

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1550

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 7.06 FT.

WATER COLUMN: 22.94 FT.

VOLUME OF WATER IN WELL: 14.91 GAL.

VOLUME OF WATER TO REMOVE: 44.73 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slight organic odor

FIELD MEASUREMENTS:

TIME: 1645

pH: 6.16 su

COND: 5.21 millisiemens

TEMP: 19°C

TURB: N/A

Eh: +235 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-9D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130776

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-10S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F: Cloudy

TIME OF START: 1103

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1111

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>16.00</u> | FT. |
| DEPTH TO WATER: | <u>5.99</u> | FT. |
| WATER COLUMN: | <u>10.01</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>6.51</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>19.53</u> | GAL. |
| VOLUME REMOVED: | <u>30.00</u> | GAL. |

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1230</u> |
| pH: | <u>6.41 su</u> |
| COND: | <u>1.55 millisemens</u> |
| TEMP: | <u>22 °C</u> |
| TURB: | <u>42 NTU</u> |
| Eh: | <u>+190 mV</u> |
| O ² : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-10S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130777

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-10D

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F; Cloudy

TIME OF START: 1050

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1057

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>31.00</u> | FT. |
| DEPTH TO WATER: | <u>9.36</u> | FT. |
| WATER COLUMN: | <u>21.64</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>14.07</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>42.21</u> | GAL. |
| VOLUME REMOVED: | <u>70.00</u> | GAL. |

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Organic odor

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1215</u> |
| pH: | <u>6.40 SU</u> |
| COND: | <u>4.96 millisiemens</u> |
| TEMP: | <u>18°C</u> |
| TURB: | <u>34 NTU</u> |
| Eh: | <u>+230 mV</u> |
| O ² : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-10D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130778

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-11S

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F; Cloudy

TIME OF START: 1150

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1157

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 2.36 FT.

WATER COLUMN: 12.64 FT.

VOLUME OF WATER IN WELL: 8.22 GAL.

VOLUME OF WATER TO REMOVE: 24.66 GAL.

VOLUME REMOVED: 30.00 GAL.

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid

FIELD MEASUREMENTS:

TIME: 1330

pH: 6.61 su

COND: 0.33 millisiemen

TEMP: 23 °C

TURB: N/A

Eh: +215 mV

O₂: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-11S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130779

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-11D

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F; Cloudy

TIME OF START: 1130

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1140

DEPTH TO BOTTOM OF WELL: 32.00 FT.

DEPTH TO WATER: 9.16 FT.

WATER COLUMN: 22.84 FT.

VOLUME OF WATER IN WELL: 14.85 GAL.

VOLUME OF WATER TO REMOVE: 44.55 GAL.

VOLUME REMOVED: 65.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Organic odor

FIELD MEASUREMENTS:

TIME: 1315

pH: 6.25 su

COND: 6.03 millisiemens

TEMP: 20 °C

TURB: N/A

Eh: +230 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-11D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130780

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-12S

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F: Cloudy

TIME OF START: 1410

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1415

DEPTH TO BOTTOM OF WELL: 16.00 FT.

DEPTH TO WATER: 5.10 FT.

WATER COLUMN: 10.90 FT.

VOLUME OF WATER IN WELL: 7.10 GAL.

VOLUME OF WATER TO REMOVE: 21.30 GAL.

VOLUME REMOVED: 36.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None

FIELD MEASUREMENTS:

TIME: 1610

pH: 6.40 su

COND: 1.37 millisiemens

TEMP: 22 °C

TURB: N/A

Eh: +190 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-12S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130781

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-12D

TYPE OF WELL: Monitoring Well

DATE: 9-11-90

STORAGE TANK: N/A

WEATHER: 70° F: Cloudy

TIME OF START: 1355

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1406

DEPTH TO BOTTOM OF WELL: 31.00 FT.

DEPTH TO WATER: 9.08 FT.

WATER COLUMN: 21.92 FT.

VOLUME OF WATER IN WELL: 14.25 GAL.

VOLUME OF WATER TO REMOVE: 42.75 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Low yield

FIELD MEASUREMENTS:

TIME: 1555

pH: 6.00 su

COND: 6.50 millisiemens

TEMP: 18 °C

TURB: N/A

Eh: +230 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-12D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130782

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-13S

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F: Cloudy

TIME OF START: 1340

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1352

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>11.00</u> | FT. |
| DEPTH TO WATER: | <u>5.89</u> | FT. |
| WATER COLUMN: | <u>5.11</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>3.32</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>9.96</u> | GAL. |
| VOLUME REMOVED: | <u>12.00</u> | GAL. |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Slight organic odor

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1430</u> |
| pH: | <u>6.31 su</u> |
| COND: | <u>0.66 millisiemens</u> |
| TEMP: | <u>22 ° C</u> |
| TURB: | <u>49 NTU</u> |
| Eh: | <u>+150 mV</u> |
| O ₂ : | <u>N/A</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-13S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130783

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-13D

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F; Cloudy

TIME OF START: 1350

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1355

DEPTH TO BOTTOM OF WELL: 32.00 FT.

DEPTH TO WATER: 10.90 FT.

WATER COLUMN: 21.10 FT.

VOLUME OF WATER IN WELL: 13.72 GAL

VOLUME OF WATER TO REMOVE: 41.16 GAL

VOLUME REMOVED: 70.00 GAL

RATE OF PURGE: 15 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None

FIELD MEASUREMENTS:

TIME: 1445

pH: 6.37 su

COND: 6.60 millisiemens

TEMP: 19 °C

TURB: 46 NTU

Eh: +170 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-13D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130784

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-14S

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F; Cloudy

TIME OF START: 1100

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1120

DEPTH TO BOTTOM OF WELL: 12.50 FT.

DEPTH TO WATER: 5.15 FT.

WATER COLUMN: 7.35 FT.

VOLUME OF WATER IN WELL: 4.78 GAL.

VOLUME OF WATER TO REMOVE: 14.34 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

Slow recharge

FIELD MEASUREMENTS:

TIME: 1210

pH: 6.71 su

COND: 1.40 millisiemens

TEMP: 21 °C

TURB: 51 NTU

Eh: +190 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-14S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130785

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-14D

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F: Cloudy

TIME OF START: 1100

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1104

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>29.50</u> | FT. |
| DEPTH TO WATER: | <u>9.22</u> | FT. |
| WATER COLUMN: | <u>20.28</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.18</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>39.54</u> | GAL. |
| VOLUME REMOVED: | <u>60.00</u> | GAL. |

RATE OF PURGE: 15 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Suds present during purging

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1200</u> |
| pH: | <u>6.21 su</u> |
| COND: | <u>7.12 millisiemens</u> |
| TEMP: | <u>19.5 °C</u> |
| TURB: | <u>67 NTU</u> |
| Eh: | <u>+210 mV</u> |
| O ² : | <u>NA</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample ID # P2-14D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130786

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-15S

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F; Cloudy

TIME OF START: 0920

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 0930

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 2.86 FT.

WATER COLUMN: 12.14 FT.

VOLUME OF WATER IN WELL: 7.89 GAL.

VOLUME OF WATER TO REMOVE: 23.67 GAL.

VOLUME REMOVED: 40.00 GAL.

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

None

FIELD MEASUREMENTS:

TIME: 1035

pH: 4.74 su

COND: 1.33 millisiemens

TEMP: 22°C

TURB: N/A

Eh: +210 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-15S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130787

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-15D

TYPE OF WELL: Monitoring Well

DATE: 9-12-90

STORAGE TANK: N/A

WEATHER: 72° F: Cloudy

TIME OF START: 0935

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 0942

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 6.68 FT.

WATER COLUMN: 23.32 FT.

VOLUME OF WATER IN WELL: 15.16 GAL.

VOLUME OF WATER TO REMOVE: 45.48 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Organic odor

FIELD MEASUREMENTS:

TIME: 1100

pH: 7.35 su

COND: 5.56 millisiemens

TEMP: 18 °C

TURB: N/A

Eh: +250 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-15D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130788

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Company

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-16S

TYPE OF WELL: Monitoring Well

DATE: 9-10-90

STORAGE TANK: N/A

WEATHER: 75° F: Cloudy

TIME OF START: 1355

SAMPLED BY: J. Powley, S. Anderson

TIME OF FINISH: 1420

DEPTH TO BOTTOM OF WELL: 15.04 FT.

DEPTH TO WATER: 6.09 FT.

WATER COLUMN: 8.95 FT.

VOLUME OF WATER IN WELL: 5.82 GAL.

VOLUME OF WATER TO REMOVE: 17.46 GAL.

VOLUME REMOVED: 25.00 GAL.

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

Organic odor

FIELD MEASUREMENTS:

TIME: 1526

pH: 6.47 su

COND: 1.35 millisiemens

TEMP: 23 ° C

TURB: 45 NTU

Eh: +130 mV

O²: N/A

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270),
PCBs (8080), TAL Metals, Total Cyanide
Sample # P2-16S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130789

MO06606J.5.32 3.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-1S

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1230 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1245 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.83</u> | FT. |
| DEPTH TO WATER: | <u>4.00</u> | FT. |
| WATER COLUMN: | <u>8.83</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>5.74</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>23.00</u> | GAL. |
| VOLUME REMOVED: | <u>25.00</u> | GAL. |

RATE OF PURGE: NA

METHOD OF PURGE: Hand Bailing

PHYSICAL APPEARANCE/COMMENTS:

Dark amber color with hydrogen sulfide odor.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1245 hrs</u> |
| pH: | <u>7.33 sp</u> |
| COND: | <u>4.58 millisiemens</u> |
| TEMP: | <u>16° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+242 mV</u> |
| O ² : | <u>2.6 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-1S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130790

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-3S

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Partly Cloudy, 45° F

TIME OF START: 0900 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 0908 hrs

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 4.67 FT.

WATER COLUMN: 10.33 FT.

VOLUME OF WATER IN WELL: 6.72 GAL.

VOLUME OF WATER TO REMOVE: 27.00 GAL.

VOLUME REMOVED: 30.00 GAL.

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor.

FIELD MEASUREMENTS:

TIME: 0945 hrs

pH: 6.93 su

COND: 356 microsiemens

TEMP: 14° C

TURB: NA

Eh: +303 mV

O²: 2.1 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-3S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130791

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-3D

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Partly Cloudy, 45° F

TIME OF START: 0912 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 0919 hrs

DEPTH TO BOTTOM OF WELL: 30.85 FT.

DEPTH TO WATER: 9.30 FT.

WATER COLUMN: 20.75 FT.

VOLUME OF WATER IN WELL: 13.49 GAL.

VOLUME OF WATER TO REMOVE: 54.00 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly dirty, organic odor.

FIELD MEASUREMENTS:

TIME: 1025 hrs

pH: 5.95 sμ

COND: 2.74 millisiemens

TEMP: 16° C

TURB: NA

Eh: +333 mV

O²: 2.9 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-3D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130792

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-4S

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1320 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1327 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>5.72</u> | FT. |
| WATER COLUMN: | <u>6.28</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>4.08</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>16.32</u> | GAL. |
| VOLUME REMOVED: | <u>20.00</u> | GAL. |

RATE OF PURGE: 3 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

None.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1400 hrs</u> |
| pH: | <u>7.01 su</u> |
| COND: | <u>522 microsiemens</u> |
| TEMP: | <u>16° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+240 mV</u> |
| O ² : | <u>3.4 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-4S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130793

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-5S

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1050 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1056 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>6.60</u> | FT. |
| WATER COLUMN: | <u>5.40</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>3.51</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>14.04</u> | GAL. |
| VOLUME REMOVED: | <u>22.00</u> | GAL. |

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Very turbid at start of purging.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1150 hrs</u> |
| pH: | <u>6.97 su</u> |
| COND: | <u>562 microsiemens</u> |
| TEMP: | <u>14.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+240 mV</u> |
| O ² : | <u>4.0 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-5S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130794

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-6S

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Cloudy, 45° F

TIME OF START: 1220 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1240 hrs

DEPTH TO BOTTOM OF WELL: 12.60 FT.

DEPTH TO WATER: 6.15 FT.

WATER COLUMN: 6.45 FT.

VOLUME OF WATER IN WELL: 4.19 GAL.

VOLUME OF WATER TO REMOVE: 16.76 GAL.

VOLUME REMOVED: 100.00 GAL.

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Very turbid at start of purging.

FIELD MEASUREMENTS:

TIME: 1300 hrs

pH: 6.85 μ

COND: 0.95 millisiemens

TEMP: 15° C

TURB: NA

Eh: +247 mV

O²: 2.6 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-6S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130795

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-6D

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1300 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1307 hrs

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 9.57 FT.

WATER COLUMN: 20.43 FT.

VOLUME OF WATER IN WELL: 13.28 GAL.

VOLUME OF WATER TO REMOVE: 53.12 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Turbid at start of purging.

FIELD MEASUREMENTS:

TIME: 1330 hrs

pH: 7.50 su

COND: 3.26 millisiemens

TEMP: 14.5° C

TURB: NA

Eh: +259 mV

O²: 4.2 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-6D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130796

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-7S

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1435 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1442 hrs

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 4.68 FT.

WATER COLUMN: 7.32 FT.

VOLUME OF WATER IN WELL: 4.76 GAL.

VOLUME OF WATER TO REMOVE: 19.04 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear.

FIELD MEASUREMENTS:

TIME: 1605 hrs

pH: 7.02 su

COND: 346 millisiemens

TEMP: 13° C

TURB: NA

Eh: +170 mV

O²: 1.9 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-7S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130797

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-7D

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Sunny, Cold, 38° F

TIME OF START: 1445 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1452 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>29.50</u> | FT. |
| DEPTH TO WATER: | <u>9.03</u> | FT. |
| WATER COLUMN: | <u>20.47</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.31</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>53.22</u> | GAL. |
| VOLUME REMOVED: | <u>65.00</u> | GAL. |

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, organic odor.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1630 hrs</u> |
| pH: | <u>6.66 su</u> |
| COND: | <u>3.38 millisiemens</u> |
| TEMP: | <u>15.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+265 mV</u> |
| O ² : | <u>1.9 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-7D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130798

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-8S

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, Cold, 35° F

TIME OF START: 1150 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1205 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>12.00</u> | FT. |
| DEPTH TO WATER: | <u>6.50</u> | FT. |
| WATER COLUMN: | <u>5.50</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>3.58</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>14.32</u> | GAL. |
| VOLUME REMOVED: | <u>10.00</u> | GAL. |

RATE OF PURGE: NA

METHOD OF PURGE: Hand Bailing

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, well was bailed to one foot of water, slow recharge.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1325 hrs</u> |
| pH: | <u>6.64 su</u> |
| COND: | <u>1.79 millisiemens</u> |
| TEMP: | <u>13.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+256 mV</u> |
| O ² : | <u>5.8 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-8S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130799

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-8D

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, Cold, 30° F

TIME OF START: 1025 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1032 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>29.00</u> | FT. |
| DEPTH TO WATER: | <u>8.75</u> | FT. |
| WATER COLUMN: | <u>20.25</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.16</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>52.64</u> | GAL. |
| VOLUME REMOVED: | <u>70.00</u> | GAL. |

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Organic odor, clear.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1055 hrs</u> |
| pH: | <u>6.98 su</u> |
| COND: | <u>3.69 millisiemens</u> |
| TEMP: | <u>15.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+303 mV</u> |
| O ² : | <u>2.5 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-8D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130800

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-9S

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Cloudy, 45° F

TIME OF START: 0900 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1235 hrs

DEPTH TO BOTTOM OF WELL: 16.00 FT.

DEPTH TO WATER: 4.42 FT.

WATER COLUMN: 11.58 FT.

VOLUME OF WATER IN WELL: 7.53 GAL.

VOLUME OF WATER TO REMOVE: 30.12 GAL.

VOLUME REMOVED: 16.00 GAL.

RATE OF PURGE: NA

METHOD OF PURGE: Hand Bailing

PHYSICAL APPEARANCE/COMMENTS:

Turbid, poor recharge, well bailed to one foot of water twice.

FIELD MEASUREMENTS:

TIME: 1235 hrs

pH: 6.68 su

COND: 1.80 millisiemens

TEMP: 18.5° C

TURB: NA

Eh: +260 mV

O²: 3.3 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-9S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130801

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-9D

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1125 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1135 hrs

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 7.12 FT.

WATER COLUMN: 22.88 FT.

VOLUME OF WATER IN WELL: 14.87 GAL

VOLUME OF WATER TO REMOVE: 59.49 GAL

VOLUME REMOVED: 70.00 GAL

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid at the start of purging, organic odor.

FIELD MEASUREMENTS:

TIME: 1220 hrs

pH: 5.84 su

COND: 3.92 millisiemens

TEMP: 18° C

TURB: NA

Eh: +230 mV

O₂: 3.1 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-9D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130802

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-10S

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1410 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1418 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>16.00</u> | FT. |
| DEPTH TO WATER: | <u>5.81</u> | FT. |
| WATER COLUMN: | <u>10.19</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>6.62</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>26.48</u> | GAL. |
| VOLUME REMOVED: | <u>40.00</u> | GAL. |

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1445 hrs</u> |
| pH: | <u>7.34 su</u> |
| COND: | <u>1.08 millisiemens</u> |
| TEMP: | <u>16° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+268 mV</u> |
| O ² : | <u>2.4 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-10S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130803

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-10D

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1440 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1447 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>31.00</u> | FT. |
| DEPTH TO WATER: | <u>9.65</u> | FT. |
| WATER COLUMN: | <u>21.35</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.88</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>55.52</u> | GAL. |
| VOLUME REMOVED: | <u>70.00</u> | GAL. |

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, organic odor.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1520 hrs</u> |
| pH: | <u>6.80 su</u> |
| COND: | <u>3.11 millisiemens</u> |
| TEMP: | <u>15.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+210 mV</u> |
| O ₂ : | <u>1.9 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-10D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130804

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-11S

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Cloudy, 45° F

TIME OF START: 0830 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 0900 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>15.00</u> | FT. |
| DEPTH TO WATER: | <u>4.50</u> | FT. |
| WATER COLUMN: | <u>10.50</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>6.83</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>27.32</u> | GAL. |
| VOLUME REMOVED: | <u>30.00</u> | GAL. |

RATE OF PURGE: NA

METHOD OF PURGE: Hand Bailing

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>0925 hrs</u> |
| pH: | <u>7.29 su</u> |
| COND: | <u>553 microsiemens</u> |
| TEMP: | <u>14.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+273 mV</u> |
| O ² : | <u>3.6 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-11S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130805

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-11D

TYPE OF WELL: Monitoring Well

DATE: 12-12-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1445 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1455 hrs

DEPTH TO BOTTOM OF WELL: 32.00 FT.

DEPTH TO WATER: 9.28 FT.

WATER COLUMN: 22.72 FT.

VOLUME OF WATER IN WELL: 14.77 GAL

VOLUME OF WATER TO REMOVE: 59.07 GAL

VOLUME REMOVED: 70.00 GAL

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, organic odor.

FIELD MEASUREMENTS:

TIME: 1615 hrs

pH: 6.81 su

COND: 2.79 millisiemens

TEMP: 14.5° C

TURB: NA

Eh: +265 mV

O₂: 1.6 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-11D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130806

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-12S

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1300 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1305 hrs

DEPTH TO BOTTOM OF WELL: 16.00 FT.

DEPTH TO WATER: 4.23 FT.

WATER COLUMN: 11.77 FT.

VOLUME OF WATER IN WELL: 7.65 GAL.

VOLUME OF WATER TO REMOVE: 30.60 GAL.

VOLUME REMOVED: 38.00 GAL.

RATE OF PURGE: 7 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Rusty at first, then clear.

FIELD MEASUREMENTS:

TIME: 1540 hrs

pH: 6.66 su

COND: 1.73 millisiemens

TEMP: 16° C

TURB: NA

Eh: +234 mV

O²: 2.0 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-12S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130807

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-12D

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1320 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1333 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>31.00</u> | FT. |
| DEPTH TO WATER: | <u>9.55</u> | FT. |
| WATER COLUMN: | <u>21.45</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.94</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>55.76</u> | GAL. |
| VOLUME REMOVED: | <u>65.00</u> | GAL. |

RATE OF PURGE: 5 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Low yield.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1505 hrs</u> |
| pH: | <u>6.76 su</u> |
| COND: | <u>4.35 millisiemens</u> |
| TEMP: | <u>17° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+265 mV</u> |
| O ² : | <u>2.0 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-12D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130808

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-13S

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1200 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1220 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>11.00</u> | FT. |
| DEPTH TO WATER: | <u>5.95</u> | FT. |
| WATER COLUMN: | <u>5.05</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>3.28</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>13.12</u> | GAL. |
| VOLUME REMOVED: | <u>20.00</u> | GAL. |

RATE OF PURGE: 1 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Black silt, turbid, organic odor.

FIELD MEASUREMENTS:

| | |
|------------------|-------------------------|
| TIME: | <u>1355 hrs</u> |
| pH: | <u>6.95 su</u> |
| COND: | <u>727 microsiemens</u> |
| TEMP: | <u>13° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+120.3 mV</u> |
| O ² : | <u>1.6 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-13S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130809

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-13D

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1220 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1227 hrs

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>32.00</u> | FT. |
| DEPTH TO WATER: | <u>10.98</u> | FT. |
| WATER COLUMN: | <u>21.02</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>13.66</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>54.64</u> | GAL. |
| VOLUME REMOVED: | <u>65.00</u> | GAL. |

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Black silt present during purging, purged until clear.

FIELD MEASUREMENTS:

| | |
|------------------|--------------------------|
| TIME: | <u>1415 hrs</u> |
| pH: | <u>6.72 su</u> |
| COND: | <u>3.90 millisiemens</u> |
| TEMP: | <u>13.5° C</u> |
| TURB: | <u>NA</u> |
| Eh: | <u>+228 mV</u> |
| O ² : | <u>3.5 mg/l</u> |

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-13D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130810

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-14S

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1100 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1107 hrs

DEPTH TO BOTTOM OF WELL: 12.50 FT.

DEPTH TO WATER: 5.15 FT.

WATER COLUMN: 7.35 FT.

VOLUME OF WATER IN WELL: 4.78 GAL.

VOLUME OF WATER TO REMOVE: 19.12 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 3 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Low yield.

FIELD MEASUREMENTS:

TIME: 1235 hrs

pH: 8.95 su

COND: 7.74 millimhos

TEMP: 14° C

TURB: NA

Eh: +190 mV

O²: 2.0 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-14S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130811

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-14D

TYPE OF WELL: Monitoring Well

DATE: 12-11-90

STORAGE TANK: NA

WEATHER: Cloudy, 38° F

TIME OF START: 1125 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1132 hrs

DEPTH TO BOTTOM OF WELL: 29.50 FT.

DEPTH TO WATER: 10.37 FT.

WATER COLUMN: 19.13 FT.

VOLUME OF WATER IN WELL: 12.44 GAL.

VOLUME OF WATER TO REMOVE: 49.76 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Suds present during purging.

FIELD MEASUREMENTS:

TIME: 1306 hrs

pH: 8.52 su

COND: 4.96 microsiemens

TEMP: 15° C

TURB: NA

Eh: +237 mV

O²: 1.5 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-14D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130812

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-15S

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Cloudy, 45° F

TIME OF START: 1015 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1025 hrs

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 8.68 FT.

WATER COLUMN: 6.32 FT.

VOLUME OF WATER IN WELL: 4.12 GAL

VOLUME OF WATER TO REMOVE: 16.48 GAL

VOLUME REMOVED: 40.00 GAL

RATE OF PURGE: 4 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Turbid initially during purging.

FIELD MEASUREMENTS:

TIME: 1055 hrs

pH: 5.40 su

COND: 1.60 millisiemens

TEMP: 14° C

TURB: NA

Eh: +370 mV

O²: 2.5 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),

TAL Total Metals, Total Cyanide

Sample ID #: P3-15S

LABORATORY NAME & LOCATION:

Enseco East

2200 Cottontail Lane

Somerset, NJ 08873

850130813

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-15D

TYPE OF WELL: Monitoring Well

DATE: 12-13-90

STORAGE TANK: NA

WEATHER: Cloudy, 45° F

TIME OF START: 1035 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1042 hrs

DEPTH TO BOTTOM OF WELL: 30.00 FT.

DEPTH TO WATER: 6.95 FT.

WATER COLUMN: 23.05 FT.

VOLUME OF WATER IN WELL: 14.98 GAL.

VOLUME OF WATER TO REMOVE: 59.92 GAL.

VOLUME REMOVED: 70.00 GAL.

RATE OF PURGE: 10 gpm

METHOD OF PURGE: Submersible Pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, organic odor.

FIELD MEASUREMENTS:

TIME: 1110 hrs

pH: 5.50 su

COND: 4.07 millisiemens

TEMP: 16° C

TURB: NA

Eh: +265 mV

O²: 1.9 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-15D

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130814

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto

PROJECT NO.: 06606J

LOCATION: Kearny Plant, NJ

WELL NUMBER: MW-16S

TYPE OF WELL: Monitoring Well

DATE: 12-17-90

STORAGE TANK: NA

WEATHER: Sunny, 45° F

TIME OF START: 1000 hrs

SAMPLED BY: J. Powley, K. Coston

TIME OF FINISH: 1030 hrs

DEPTH TO BOTTOM OF WELL: 15.04 FT.

DEPTH TO WATER: 6.05 FT.

WATER COLUMN: 8.99 FT.

VOLUME OF WATER IN WELL: 5.84 GAL.

VOLUME OF WATER TO REMOVE: 23.36 GAL.

VOLUME REMOVED: 27.00 GAL.

RATE OF PURGE: NA

METHOD OF PURGE: Hand Bailed

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, organic odor.

FIELD MEASUREMENTS:

TIME: 1125 hrs

pH: 6.58 su

COND: 1.17 millisiemens

TEMP: 15° C

TURB: NA

Eh: +245 mV

O₂: 3.1 mg/l

TYPES OF SAMPLES COLLECTED:

VOAs + 15 (8240), SVOAs + 15 (8270), PCBs (8080),
TAL Total Metals, Total Cyanide
Sample ID #: P3-16S

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, NJ 08873

850130815

MO06606J.5.11 12.90

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-1S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50° F: Cloudy, windy

TIME OF START: 1730

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1750

DEPTH TO BOTTOM OF WELL: 12.50 FT.

DEPTH TO WATER: 3.92 FT.

WATER COLUMN: 8.58 FT.

VOLUME OF WATER IN WELL: 5.58 GAL.

VOLUME OF WATER TO REMOVE: 16.74 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: N/A

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Amber colored, no odor, Sample ID#, P4-1S

FIELD MEASUREMENTS:

TIME: 1750

pH: 7.62 su

COND: 15.620 μ MHOS

TEMP: 14 °C

TURB: 26 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130816

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-3S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 50° F, Sunny, windy

TIME OF START: 1130

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1133

DEPTH TO BOTTOM OF WELL: 12.30 FT.

DEPTH TO WATER: 4.53 FT.

WATER COLUMN: 7.77 FT.

VOLUME OF WATER IN WELL: 5.05 GAL.

VOLUME OF WATER TO REMOVE: 15.15 GAL.

VOLUME REMOVED: 18.00 GAL.

RATE OF PURGE: 6.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, sample ID # P4-3S.

FIELD MEASUREMENTS:

TIME: 1410

pH: 7.84

COND: 393 microsiemens

TEMP: 14 °C

TURB: 26 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130817

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-3D

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 50° F: Sunny, windy

TIME OF START: 1145

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1150

DEPTH TO BOTTOM OF WELL: 31.10 FT.

DEPTH TO WATER: 8.88 FT.

WATER COLUMN: 22.22 FT.

VOLUME OF WATER IN WELL: 14.44 GAL.

VOLUME OF WATER TO REMOVE: 43.32 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, organic odor, Sample ID # P4-3D.

FIELD MEASUREMENTS:

TIME: 1425

pH: 6.83 su

COND: 7.00 millisiemens

TEMP: 15°C

TURB: .35 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130818

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-4S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50° F: Cloudy, windy

TIME OF START: 1540

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1543

DEPTH TO BOTTOM OF WELL: 12.00 FT.

DEPTH TO WATER: 4.86 FT.

WATER COLUMN: 7.15 FT.

VOLUME OF WATER IN WELL: 4.65 GAL.

VOLUME OF WATER TO REMOVE: 13.95 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 5 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, sample ID # P4-4S

FIELD MEASUREMENTS:

TIME: 1625

pH: 7.39 su

COND: 809 μ MHOS

TEMP: 13 °C

TURB: 31 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130819

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-5S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50° F: Cloudy, windy

TIME OF START: 1605

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1608

DEPTH TO BOTTOM OF WELL: 12.25 FT.

DEPTH TO WATER: 5.32 FT.

WATER COLUMN: 6.93 FT.

VOLUME OF WATER IN WELL: 4.51 GAL.

VOLUME OF WATER TO REMOVE: 13.53 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 5.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

clear, no odor, sample ID #: P4-5S

FIELD MEASUREMENTS:

TIME: 1640

pH: 7.40 su

COND: 1205 μ MHOS

TEMP: 12 °C

TURB: 29 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130820

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-6S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 50° F: Sunny, windy

TIME OF START: 1320

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1325

DEPTH TO BOTTOM OF WELL: 12.60 FT.

DEPTH TO WATER: 5.88 FT.

WATER COLUMN: 6.72 FT.

VOLUME OF WATER IN WELL: 4.37 GAL.

VOLUME OF WATER TO REMOVE: 13.11 GAL.

VOLUME REMOVED: 25.00 GAL.

RATE OF PURGE: 5 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, no odor, Sample ID # P4-6S.

FIELD MEASUREMENTS:

TIME: 1515

pH: 6.64 su

COND: 606 microsiemens

TEMP: 15 °

TURB: 30 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130821

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-6D

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50° F; Cloudy, windy

TIME OF START: 1220

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1225

DEPTH TO BOTTOM OF WELL: 29.34 FT.

DEPTH TO WATER: 8.89 FT.

WATER COLUMN: 20.45 FT.

VOLUME OF WATER IN WELL: 13.29 GAL.

VOLUME OF WATER TO REMOVE: 39.88 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9.0 gallons per minutes

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID #: P4-6D

FIELD MEASUREMENTS:

TIME: 1310

pH: 6.80 su

COND: 8380 μ MHOS

TEMP: 14 °C

TURB: 19 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130822

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-7S

TYPE OF WELL: Monitoring Well

DATE: 03/19/91

STORAGE TANK: NA

WEATHER: 50° F: Cloudy, windy

TIME OF START: 1300

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1303

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>11.55</u> | FT. |
| DEPTH TO WATER: | <u>3.92</u> | FT. |
| WATER COLUMN: | <u>7.63</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>4.96</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>14.88</u> | GAL. |
| VOLUME REMOVED: | <u>15.00</u> | GAL. |

RATE OF PURGE: 5.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID # P4-7S

FIELD MEASUREMENTS:

| | |
|------------------|----------------|
| TIME: | <u>1445</u> |
| pH: | <u>7.29 su</u> |
| COND: | <u>446</u> |
| TEMP: | <u>18 ntu</u> |
| TURB: | <u>12 °C</u> |
| Eh: | <u>--</u> |
| O ² : | <u>--</u> |

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130823

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-7D

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50° F; Cloudy, windy

TIME OF START: 1310

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1315

DEPTH TO BOTTOM OF WELL: 28.43 FT.

DEPTH TO WATER: 8.25 FT.

WATER COLUMN: 20.18 FT.

VOLUME OF WATER IN WELL: 13.12 GAL.

VOLUME OF WATER TO REMOVE: 39.36 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9 gallons per minutes

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, slight organic odor. Sample ID # P4-7D

FIELD MEASUREMENTS:

TIME: 1500

pH: 7.35 su

COND: 12.590 μ MHOS

TEMP: 15.5 °C

TURB: 35 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130824

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-8S

TYPE OF WELL: Monitoring Well

DATE: 3/18/91

STORAGE TANK: NA

WEATHER: 45° F. Rain, windy

TIME OF START: 0852

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0857

DEPTH TO BOTTOM OF WELL: 11.16 FT.

DEPTH TO WATER: 7.18 FT.

WATER COLUMN: 3.98 FT.

VOLUME OF WATER IN WELL: 2.59 GAL.

VOLUME OF WATER TO REMOVE: 7.77 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 3.0 gallons per minute

METHOD OF PURGE: Submersible

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID # P4-8S

FIELD MEASUREMENTS:

TIME: 1015

pH: 5.88 su

COND: 2100 µMHOS

TEMP: 8 °C

TURB: 23 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130825

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-8D

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 45° F: rain, windy

TIME OF START: 0857

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0902

DEPTH TO BOTTOM OF WELL: 28.52 FT.

DEPTH TO WATER: 7.24 FT.

WATER COLUMN: 21.28 FT.

VOLUME OF WATER IN WELL: 13.83 GAL.

VOLUME OF WATER TO REMOVE: 41.49 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9 gallons per minutes

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, slight organic odor, Sample ID # P4-8D. Matrix spike and matrix spike duplicate taken at this location: Sample ID #'s P4-MS, P4-MSD.

FIELD MEASUREMENTS:

TIME: 1100

pH: 5.84 su

COND: 8480 μ MHOS

TEMP: 12.5 °C

TURB: 31 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier I Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130826

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-9S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F; Sunny, windy

TIME OF START: 1000

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1030

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 4.52 FT.

WATER COLUMN: 10.48 FT.

VOLUME OF WATER IN WELL: 6.81 GAL.

VOLUME OF WATER TO REMOVE: 20.43 GAL.

VOLUME REMOVED: 10.00 GAL.

RATE OF PURGE: N/A

METHOD OF PURGE: Hand bailed

PHYSICAL APPEARANCE/COMMENTS:

Well purged dry after removing 10 gallons. Turbid, no odor.

FIELD MEASUREMENTS:

TIME: 1350

pH: 7.00 su

COND: 1150 microsiemens

TEMP: 15 ° C

TURB: 33 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130827

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-9D

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F: Sunny, windy

TIME OF START: 1020

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1030

DEPTH TO BOTTOM OF WELL: 28.00 FT.

DEPTH TO WATER: 6.61 FT.

WATER COLUMN: 21.39 FT.

VOLUME OF WATER IN WELL: 13.90 GAL.

VOLUME OF WATER TO REMOVE: 41.70 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 4.5 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Amber color, slight organic odor, Sample ID #, P4-9D

FIELD MEASUREMENTS:

TIME: 1320

pH: 6.84 su

COND: 6.31 millisiemens

TEMP: 15 °C

TURB: 24 ntu

Eh: --

O₂: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130828

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-10S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50 ° F: Cloudy, windy

TIME OF START: 1445

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1450

DEPTH TO BOTTOM OF WELL: 15.55 FT.

DEPTH TO WATER: 5.55 FT.

WATER COLUMN: 10.00 FT.

VOLUME OF WATER IN WELL: 6.50 GAL.

VOLUME OF WATER TO REMOVE: 19.50 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 4.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, slight organic odor, Sample ID # P4-10S

FIELD MEASUREMENTS:

TIME: 1535

pH: 7.36 su

COND: 876 µMHOS

TEMP: 14 ° C

TURB: 25 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130829

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-10D

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50 ° F; Cloudy, windy

TIME OF START: 1500

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1505

DEPTH TO BOTTOM OF WELL: 29.49 FT.

DEPTH TO WATER: 8.98 FT.

WATER COLUMN: 20.51 FT.

VOLUME OF WATER IN WELL: 13.33 GAL.

VOLUME OF WATER TO REMOVE: 39.99 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, slight organic odor, Sample ID # : P4-10D

FIELD MEASUREMENTS:

TIME: 1550

pH: 7.28 su

COND: 9960 µMHOS

TEMP: 13 °C

TURB: 26 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130830

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-11S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F; Sunny, windy

TIME OF START: 0820

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0825

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>15.00</u> | FT. |
| DEPTH TO WATER: | <u>4.06</u> | FT. |
| WATER COLUMN: | <u>10.94</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>7.11</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>21.33</u> | GAL. |
| VOLUME REMOVED: | <u>25.00</u> | GAL. |

RATE OF PURGE: 5.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, organic odor, Sample ID # P4-11S. Matrix spike and matrix spike duplicate samples collected at this location, Sample ID #; P4-MS2, P4-MSD2

FIELD MEASUREMENTS:

| | |
|------------------|-----------------|
| TIME: | <u>1115</u> |
| pH: | <u>6.80 su</u> |
| COND: | <u>15 µMHOS</u> |
| TEMP: | <u>12.5 °C</u> |
| TURB: | <u>30 ntu</u> |
| Eh: | <u>--</u> |
| O ² : | <u>--</u> |

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 820, SVOAs
EPA Method 608, PCBs
Tier I Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130831

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-11D

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F: Sunny, windy

TIME OF START: 0835

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0840

DEPTH TO BOTTOM OF WELL: 29.00 FT.

DEPTH TO WATER: 8.94 FT.

WATER COLUMN: 20.06 FT.

VOLUME OF WATER IN WELL: 13.04 GAL.

VOLUME OF WATER TO REMOVE: 39.12 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, slight organic odor, Sample ID # P4-11D. Matrix spike and matrix spike duplicate samples were collected at this location, Sample ID #s; P4-11DMS, P4-11DMSD.

FIELD MEASUREMENTS:

TIME: 1145

pH: 6.61

COND: 10 µMHOS

TEMP: 13°C

TURB: 20 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier I Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130832

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-12S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F: Sunny, windy

TIME OF START: 0920

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0930

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 4.43 FT.

WATER COLUMN: 10.57 FT.

VOLUME OF WATER IN WELL: 6.87 GAL.

VOLUME OF WATER TO REMOVE: 20.61 GAL.

VOLUME REMOVED: 25.00 GAL.

RATE OF PURGE: N/A

METHOD OF PURGE: Hand bailing

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID #: P4-12S

FIELD MEASUREMENTS:

TIME: 1235

pH: 6.68 su

COND: 763 microsiemens

TEMP: 14°C

TURB: 46 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130833

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-12D

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 45° F: Sunny windy

TIME OF START: 0930

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 0935

DEPTH TO BOTTOM OF WELL: 29.00 FT.

DEPTH TO WATER: 9.51 FT.

WATER COLUMN: 19.49 FT.

VOLUME OF WATER IN WELL: 12.67 GAL

VOLUME OF WATER TO REMOVE: 38.01 GAL

VOLUME REMOVED: 45.00 GAL

RATE OF PURGE: 9 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, no odor, Sample ID # P4-12D

FIELD MEASUREMENTS:

TIME: 1250

pH: 6.93 su

COND: 6.53 millisiemens

TEMP: 15 °C

TURB: 55 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130834

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-13S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 45 °F: rain, windy

TIME OF START: 0953

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1020

| | | |
|----------------------------|--------------|------|
| DEPTH TO BOTTOM OF WELL: | <u>11.23</u> | FT. |
| DEPTH TO WATER: | <u>4.55</u> | FT. |
| WATER COLUMN: | <u>6.68</u> | FT. |
| VOLUME OF WATER IN WELL: | <u>4.34</u> | GAL. |
| VOLUME OF WATER TO REMOVE: | <u>13.02</u> | GAL. |
| VOLUME REMOVED: | <u>15.00</u> | GAL. |

RATE OF PURGE: 2 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Very turbid, slight organic odor, Sample ID#: P4-13S

FIELD MEASUREMENTS:

| | |
|------------------|---------------------------------|
| TIME: | <u>1215</u> |
| pH: | <u>5.00 su</u> |
| COND: | <u>751 μMHOS</u> |
| TEMP: | <u>12 °C</u> |
| TURB: | <u>35 ntu</u> |
| Eh: | <u>--</u> |
| O ² : | <u>--</u> |

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130835

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-13D

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 45 °F: rain, windy

TIME OF START: 0955

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1001

DEPTH TO BOTTOM OF WELL: 30.83 FT.

DEPTH TO WATER: 11.92 FT.

WATER COLUMN: 18.91 FT.

VOLUME OF WATER IN WELL: 12.29 GAL.

VOLUME OF WATER TO REMOVE: 36.87 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 7.5 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID #: P4-13D

FIELD MEASUREMENTS:

TIME: 1200

pH: 5.40 su

COND: 13,100 μ MHOS

TEMP: 13 °C

TURB: 15.5 nt μ

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130836

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-14S

TYPE OF WELL: Monitoring Well

DATE: 3/18/91

STORAGE TANK: NA

WEATHER: 45° F: Heavy rains, windy

TIME OF START: 1536

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1542

DEPTH TO BOTTOM OF WELL: 12.25 FT.

DEPTH TO WATER: 5.07 FT.

WATER COLUMN: 7.18 FT.

VOLUME OF WATER IN WELL: 4.68 GAL.

VOLUME OF WATER TO REMOVE: 14.04 GAL.

VOLUME REMOVED: 15.00 GAL.

RATE OF PURGE: 2.5 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Turbid, slight organic odor, sample ID # P4-14S

FIELD MEASUREMENTS:

TIME: 1640

pH: 6.43 su

COND: 845 μ MHOS

TEMP: 15 °C

TURB: 49 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130837

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-14D

TYPE OF WELL: Monitoring Well

DATE: 3/18/91

STORAGE TANK: NA

WEATHER: 45° F: Heavy rain, windy

TIME OF START: 1542

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1547

DEPTH TO BOTTOM OF WELL: 28.70 FT.

DEPTH TO WATER: 8.51 FT.

WATER COLUMN: 20.19 FT.

VOLUME OF WATER IN WELL: 13.12 GAL.

VOLUME OF WATER TO REMOVE: 39.36 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID # P4-14D

FIELD MEASUREMENTS:

TIME: 1700

pH: 5.98 su

COND: 6960 μ MHOS

TEMP: 16 °C

TURB: 25 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130838

MO06606J.5.33 2.91

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-15S

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 50° F: Sunny, windy

TIME OF START: 1225

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1228

DEPTH TO BOTTOM OF WELL: 15.00 FT.

DEPTH TO WATER: 2.02 FT.

WATER COLUMN: 12.98 FT.

VOLUME OF WATER IN WELL: 8.44 GAL.

VOLUME OF WATER TO REMOVE: 25.32 GAL.

VOLUME REMOVED: 26.00 GAL.

RATE OF PURGE: 5.0 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, no odor, Sample ID# P4-15S

FIELD MEASUREMENTS:

TIME: 1450

pH: 7.30 su

COND: 2.87 millisiemens

TEMP: 15 °C

TURB: 33 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130839

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-15D

TYPE OF WELL: Monitoring Well

DATE: 3/20/91

STORAGE TANK: NA

WEATHER: 50° F: Sunny, windy

TIME OF START: 1235

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1240

DEPTH TO BOTTOM OF WELL: 29.00 FT.

DEPTH TO WATER: 6.55 FT.

WATER COLUMN: 22.45 FT.

VOLUME OF WATER IN WELL: 14.59 GAL.

VOLUME OF WATER TO REMOVE: 43.77 GAL.

VOLUME REMOVED: 45.00 GAL.

RATE OF PURGE: 9 gallons per minute

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Clear, strong organic odor, Sample ID # P4-15D

FIELD MEASUREMENTS:

TIME: 1435

pH: 6.10 su

COND: 7.40 millisiemens

TEMP: 13 °C

TURB: 36 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130840

WELL SAMPLING DATA FORM

CLIENT: Monsanto Chemical Co.

PROJECT NO.: 06606J

LOCATION: Monsanto Kearny Plant

WELL NUMBER: MW-16S

TYPE OF WELL: Monitoring Well

DATE: 3/19/91

STORAGE TANK: NA

WEATHER: 50 ° F: Cloudy, windy

TIME OF START: 1140

SAMPLED BY: J. Powley, P. Burns, E. Risha

TIME OF FINISH: 1145

DEPTH TO BOTTOM OF WELL: 15.21 FT.

DEPTH TO WATER: 5.75 FT.

WATER COLUMN: 9.46 FT.

VOLUME OF WATER IN WELL: 6.15 GAL.

VOLUME OF WATER TO REMOVE: 18.45 GAL.

VOLUME REMOVED: 20.00 GAL.

RATE OF PURGE: 4 gallons per minutes

METHOD OF PURGE: Submersible pump

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, slight organic odor. Sample ID#: P4-16S

FIELD MEASUREMENTS:

TIME: 1245

pH: 6.64 su

COND: 896 μ MHOS

TEMP: 12 °C

TURB: 43 ntu

Eh: --

O²: --

TYPES OF SAMPLES COLLECTED:

EPA Method 8240, VOAs
EPA Method 8270, SVOAs
EPA Method 608, PCBs
Tier II Deliverables

LABORATORY NAME & LOCATION:

Enseco East
2200 Cottontail Lane
Somerset, New Jersey

850130841

APPENDIX K

Air Monitoring Field Logs.

AIR SAMPLING FORM

DATE:

5/14/90

AIR SAMPLING BY:

Monsanto-Kearny

TEMP (°F):

70°F

SITE NUMBER:

06606

FACILITY:

COLLECTION MEDIA:

13mm polypropylene filters

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-1 | F-1 | | PCB area ¹ | 12:24 | 18:46 | 382 | 22.92 | | | |
| | | | | | | | | | | |
| P-2 | F-2 | | PCB area ² | 12:31 | 18:51 | 380 | 22.80 | | | |
| | | | | | | | | | | |
| P-3 | F-3 | | Upwind | 12:34 | 18:54 | 378 | 22.68 | | | |
| | | | | | | | | | | |
| P-4 | F-4 | | Downwind | 12:15 | 18:40 | 385 | 23.10 | | | |
| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: clear winds from the north

850130843

ROUX ASSOCIATES INC

Supplement to Monsanto-Kearny Health and Safety Logbook.

ASF:4/90

AIR SAMPLING FORM

DATE: 5/14/90
FACILITY: Monsanto-Kearny

AIR SAMPLING BY: _____
TEMP (°F): 70°F

SITE NUMBER: 06606
COLLECTION MEDIA: 37mm PVC filters

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-5 | F-31 | | PCB area ¹ | 12:24 | 18:46 | 382 | 573.0 | | | |
| P-6 | F-32 | | PCB area ² | 12:31 | 18:51 | 380 | 570.00 | | | |
| P-7 | F-33 | | Upwind | 12:36 | 18:54 | 378 | 567.00 | | | |
| P-8 | F-34 | | Downwind | 12:15 | 18:40 | 385 | 577.50 | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS Weather: clear, winds from the north

Supplement to Monsanto-Kearny
Health and Safety Logbook. 5/14/90

850130844

ROUX ASSOCIATES INC

ASF:4/90

AIR SAMPLING FORM

DATE: 5/15/90
FACILITY: Monsanto-Kearny

AIR SAMPLING BY: _____
TEMP (°F): 72°F

SITE NUMBER: 06626
COLLECTION MEDIA: 3mm Polypropylene

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-1 | F-5 | | PCB area ¹ | 9:14 | 17:16 | 482 | 28.92 | | | |
| P-2 | F-6 | | PCB area ² | 9:21 | 17:27 | 481 | 28.86 | | | |
| P-3 | F-7 | | Upwind | 9:04 | 17:09 | 485 | 29.10 | | | |
| P-4 | F-8 | | Downwind | 9:26 | 17:26 | 480 | 28.80 | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: clear to partly cloudy, winds from the south.

850130845

ROUX ASSOCIATES INC

Supplement to Monsanto-Kearny
Health and Safety Handbook.

ASF-4/90

AIR SAMPLING FORM

DATE: 5/15/90 AIR SAMPLING BY: _____ SITE NUMBER: D6606
 FACILITY: Monsanto/Kearney TEMP (°F): _____ COLLECTION MEDIA: 37mm PVC

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-5 | F-35 | | PCB area ¹ | 9:14 | 17:16 | 482 | 723.0 | | | |
| P-6 | F-36 | | PCB area ² | 9:21 | 17:22 | 481 | 721.50 | | | |
| P-7 | F-37 | | Upwind | 9:04 | 11:35 | 151 | 226.50 | | | |
| P-8 | F-38 | | Downwind | 9:26 | 17:26 | 480 | 720.0 | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS Weather: clear to partly cloudy, winds from the south

Supplement to Monsanto/Kearney
Health and Safety Logbook

AIR SAMPLING FORM

DATE:

5/16/90

AIR SAMPLING BY:

TEMP (°F):

65°F

SITE NUMBER:

06606

FACILITY:

Monsanto - Kearny

COLLECTION MEDIA:

37mm PVC

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-5 | F-39 | | PCB area ¹ | 8:25 | 10:00 | 145 | 217.50 | | | |
| | F-42B | | | 10:30 | 10:45 | 15 | 22.50 | | | |
| P-6 | F-40 | | PCB area ² | 8:31 | 9:40 | 69 | 103.50 | | | |
| | F-43B | | | 10:34 | 10:45 | 11 | 16.50 | | | |
| P-8 | F-41 | | Downwind | 8:38 | 10:41 | 48.3 | 724.50 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: Showers with occasional downpours winds from the southwest

ROUX ASSOCIATES INC

Supplement to Monsanto-Kearny
Health and Safety Logbook

Bill H. P. 1/1/91

ASF:4/90

850130847

AIR SAMPLING FORM

DATE: 5/16/90
FACILITY: Monsanto-Kearney

AIR SAMPLING BY: _____
TEMP (°F): 65°F

SITE NUMBER: 06606
COLLECTION MEDIA: 13mm Polycarbonate

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|------------------------------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-1 | F-9 | | PCB area ¹ | 8:25 | 16:38 | 493 | 29.58 | | | |
| | | | | | | | | | | |
| P-2 | F-10 | | PCB area ² | 8:31 | 16:39 | 488 | 29.25 | | | |
| | | | | | | | | | | |
| P-3 | F-11 | | Downwind ^{up} Upwind | 8:40 | 16:50 | 490 | 29.40 | | | |
| | | | | | | | | | | |
| P-4 | F-12 | | Downwind | 8:38 | 16:41 | 483 | 29.98 | | | |
| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS Weather: Showers with occasional downpours, winds from the southwest

Page 2 of 2

AIR SAMPLING FORM

DATE: 5/17/90
FACILITY: Monsanto-Kearny

AIR SAMPLING BY: _____
TEMP (°F): 60°F

SITE NUMBER: 06606
COLLECTION MEDIA: 13mm Polypropylene

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-----------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-1 | F-13 | | PCB area ¹ | 8:00 | 16:04 | 484 | 29.04 | | | |
| P-2 | F-14 | | PCB area ² | 8:02 | 16:05 | 483 | 28.98 | | | |
| P-3 | F-15 | | Upwind | 8:04 | 16:07 | 483 | 28.98 | | | |
| P-4 | F-16 | | Downwind | 7:55 | 15:58 | 483 | 28.98 | | | |

Page 1 of 2

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS Weather: Overcast, winds from the north-northeast
Activities: Abandon old well 9-d, develop wells

Supplement to Monsanto-Kearny
Health and Safety Logbook
11/11/11

AIR SAMPLING FORM

DATE: 5/17/90
FACILITY: Monsieur Kearny

AIR SAMPLING BY: _____
TEMP (°F): _____

SITE NUMBER: 06606
COLLECTION MEDIA: 57 mm PRC

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|-------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-8 | F-44 | | Downwind | 7:53 | 15:58 | 483 | 724.50 | | | |
| | | | | | | 483 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: Overcast, winds from the north-northeast
Activities: Abandon old well 9-d, develop wells

Supplement to Monsieur Kearny
Health and Safety Record

AIR SAMPLING FORM

DATE:

5/18/90

AIR SAMPLING BY:

SITE NUMBER:

06606

FACILITY:

Monsanto-Kearny

TEMP (°F):

70°F

COLLECTION MEDIA:

13mm Polysorbene

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|---------|-----------|--------------|---------------------------------|---------|----------|---------------|---------------|----------|---------------|------------|
| P-1 | F-17 | | PCB area ¹ | 7:57 | 16:09 | 492 | 29.52 | | | |
| | | | PCB area ² 6/5/18/90 | | | | | | | |
| P-2 | F-18 | | PCB area ² | 8:01 | 16:12 | 491 | 29.46 | | | |
| P-3 | F-19 | | Upwind | 7:50 | 16:05 | 495 | 29.70 | | | |
| P-4 | F-20 | | Downwind | 8:06 | 16:14 | 488 | 29.28 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: Sunny with strong winds from the west
Activities: Well developed

ROUX ASSOCIATES INC

Supplement to Monsanto-Kearny
Health and Safety Logbook

Edi/K.L. L.

ASF-4/90

850130851

AIR SAMPLING FORM

DATE:

5/18/90

AIR SAMPLING BY:

Edie M. Gair

SITE NUMBER:

06606

FACILITY:

Monsanto-Kearny

TEMP (°F):

70°F

COLLECTION MEDIA:

37mm PVC filters

| Pump No | Sample No | Sample Type* | Description | Time On | Time Off | Total Minutes | Volume Liters | Lab Nos. | Lab Results** | TWA 8 Hrs. |
|----------------|-----------------|--------------|-----------------------|------------------|------------------|---------------|---------------|----------|---------------|------------|
| P-8 | F-34 | | Downwind | 12:15 | 16:40 | | | | | |
| P-5 | F-47 | | PCB area ¹ | 7:57 | 16:09 | 492 | 738.0 | | | |
| P-6 | F-48 | | PCB area ² | 8:01 | 16:12 | 491 | 736.50 | | | |
| P-7 | F-49 | | Upwind | 7:50 | 16:05 | 495 | 742.50 | | | |
| P-8 | F-50 | | Downwind | 8:06 | 16:14 | 488 | 732.0 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

* If Breathing Zone (BZ), give personnel Name, Job Title and Social Security Number. If General Area (GA), give sampling location

**Insert (+) if value exceeds PEL

COMMENTS

Weather: Sunny with strong winds from the west
Activities: Well development

Supplement to Monsanto-Kearny
Health and Safety Logbook

ROUX ASSOCIATES INC

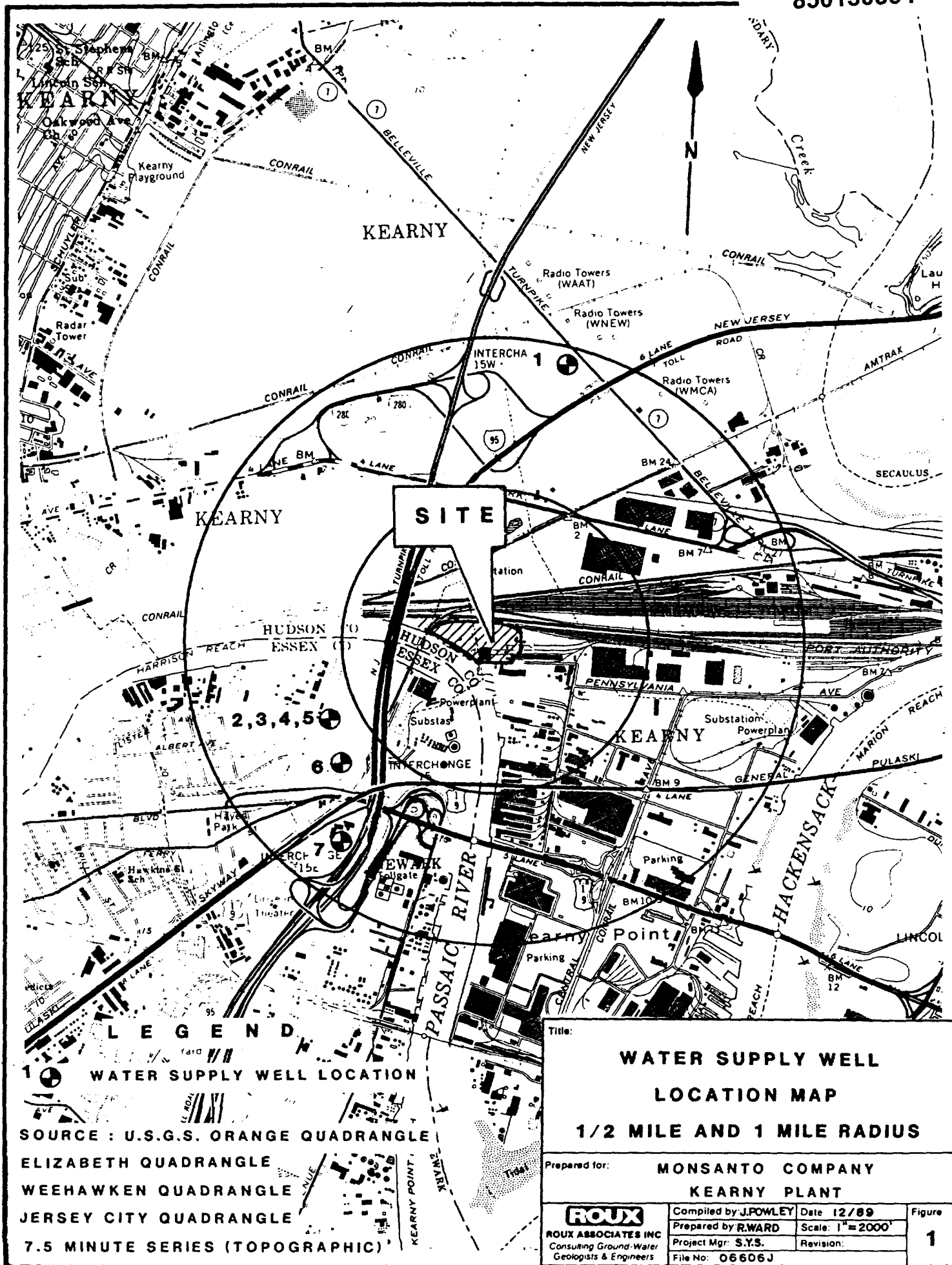
ASF-4/90

850130852

APPENDIX L

Well Records and Supply Well Locations - One-Mile Radius.

850130854



List of Water Supply Wells Located Within One Mile of Monsanto Kearny Plant. Kearny, New Jersey.

| Location No.
Reference | Owner | Usage | Total Depth*
Date
Installed | Depth to
of
Well (ft) | Static
Water level (ft) | Diameter/
Construction | Yield (gpm) |
|---------------------------|-----------------------------------|-------|-----------------------------------|-----------------------------|----------------------------|---------------------------|-------------|
| 1 | Schiavone Construction
Company | C | ? | 215 | 23 | 6" Steel | 6 |
| 2 | Newark Paraffine Company | C | 4/10/58 | 503 | 26 | 8" Steel | 100 |
| 3 | Eureka Construction
Company | C | 1/23/59 | 500 | 25 | 8" Steel | 75 |
| 4 | Fairmont Chemical
Company | C | 8/5/65 | 300 | 50 | 8" Steel | 300 |
| 5 | Fairmont Chemical
Company | C | 9/18/68 | 250 | 70 | 8" Steel | 250 |
| 6 | Arden Chemical Company | C | 3/18/52 | 400 | 21 | 8" Steel | 400 |
| 7 | Coca Cola Company | D | 5/1/81 | 650 | 25 | 6" Drive Pipe | 20 |

C = Commerical/Industrial

D = Domestic

* = All wells completed in the Brunswick Formation.

850130855

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13.783
26-7516
26-7516-1
APPLICATION NO _____
COUNTY Hudson

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches - Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at -- Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No xx
Taste _____ Odor diesel oil Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130856

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13 783
26-7517
PERMIT NO. ~~10-1017~~
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at -- Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130857

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13.783
26-7518
PERMIT NO ~~25-7518~~
APPLICATION NO _____
COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet 106 to 98 - fill cinders
Bottom 94 Feet 98 to 94 - organic meadows mat
Geologic Formation _____
Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at _____ Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfg. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch m.w. sketch of special casing arrangements, etc.)

850130858

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13 183
26-7519
PERMIT NO. 26-2010-19
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at _____ Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130859

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-7516-20
PERMIT NO. 26-7516-20
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
- Range in Depth { Top 106 Feet
Bottom 94 Feet
- Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at -- Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130860

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13 783
26-7921
PERMIT NO. 26-7510-21
APPLICATION NO. _____
COUNTY HUBSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Molecrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at -- Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130861

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-15-785

26-7522

PERMIT NO. ~~26-7514-22~~

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER NewJersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
- Range in Depth { Top 106 Feet
Bottom 94 Feet
- Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at _____ Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE. Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130862

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO - 20-7516-23

APPLICATION NO _____

COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at _____ Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfr. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130863

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-7546-24

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike

Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)

2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town

3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation

DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet

4. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet

5. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet

Range in Depth { Top 106 Feet
Bottom 94 Feet
Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat

Tail Piece: Diameter _____ Inches Length _____ Feet

7. WELL FLOWS NATURALLY -- Gallons per minute at -- Feet above surface

Water rises to zero Feet above surface

RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute

Static water level before pumping 104 Feet below surface

Pumping level 98 feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil

8. PERMANENT PUMPING EQUIPMENT:

Type submersible Mfrs. Name Grundfos

Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750

Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No xx

Taste _____ Odor diesel oil Color _____ Temp. _____ OF.

12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130864

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-7511-25

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER New Jersey Transit Authority ADDRESS Harrison Turnpike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 21A - Block 284 - Municipality -- Kearny - Town
3. DATE COMPLETED March 29, 1985 DRILLER Moretrench American Corporation
4. DIAMETER: Top twelve inches Bottom twelve inches TOTAL DEPTH twelve Feet
5. CASING: Type PVC Schedule 40 Diameter _____ Inches Length _____ Feet
6. SCREEN: Type plastic Size of Opening .010 Diameter _____ Inches Length _____ Feet
Range in Depth { Top 106 Feet
Bottom 94 Feet } Geologic Formation 106 to 98 - fill cinders
98 to 94 - organic meadows mat
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY -- Gallons per minute at _____ Feet above surface
Water rises to zero Feet above surface
8. RECORD OF TEST: Date April 5, 1985 Yield five Gallons per minute
Static water level before pumping 104 Feet below surface
Pumping level 98 feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells depth of drawdown controlled for removal of diesel oil
9. PERMANENT PUMPING EQUIPMENT:
Type submersible Mfrs. Name Grundfos
Capacity ten G.P.M. How Driven electric H.P. 1/3 R.P.M. 3750
Depth of Pump in well ten Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well zero Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No XX
Taste _____ Odor diesel oil Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY William Johnston Date April 5, 1985

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130865

VR. 8A
18

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL RECORD

PERMIT NO. 2614469-7
APPLICATION NO. _____
COUNTY Middlesex
COORD. 26.13.7.81

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 1-5-89
3. DATE COMPLETED _____ DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICK EMPSON #1312 Date 1/16/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130866

21-1

850130867

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2614497-2
APPLICATION NO. _____
COUNTY Middlesex
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 1-5-89
3. DATE COMPLETED _____ DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICK EMPSON #1312 Date 1/16/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130868

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850130869

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2615445-5
APPLICATION NO. _____
COUNTY Hudson
COORD. 26.13.7.7s

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 52, 24C, 21A, 39, Block 284
3. DATE COMPLETED 2/6/89 DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.5 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.5 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY MIKE DANIELS #1423 Date 2/14/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130870

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP | <div style="text-align: center; font-weight: bold; font-size: 1.2em;">EMPIRE</div> <div style="text-align: center; font-weight: bold; font-size: 0.8em;">SOILS INVESTIGATIONS INC</div> | HOLE NO. <u>W-5</u>
GRD. ELEV. _____ |
|-------------------------------------------------------------------------|--------------|--------------|------------|---------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <u>2/6</u> | <u>11:00</u> | <u>2-7</u> | | | | FIELD LOG | 26-15445-5 |
| | | | | | | | |
| | | | | | | | |
| PROJECT <u>APR</u>
LOCATION <u>K. ...</u> Sheet <u>1</u> of <u>1</u> | | | | | | | |

| DEPTH OF SAMPLE | SAMPLE NO | BLOWS ON SAMPLER | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
|-----------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------|-------|-----------------|----------------------------------------------------|------------|--------------|
| | | <div style="display: flex; justify-content: space-around;"> 0/6 6/12 12/18 N </div> | | | | | | | |
| | | | | | | | 0' to 4' <u>Coarse</u> | | |
| 5-7 | 1 | 4 3 | 5 3 | | | | 4' to 12' <u>Fin. Fine Sand</u>
<u>-10 silt</u> | | |
| 10-12 | 2 | 2 2 | 3 4 | | | | <u>10 silt</u> | | |
| | | | | | | | DRILLERS CLASSIFICATION | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | EOH
12.5' | | |

NOTATION: SIZE AUGERS CASING 6 1/4 SIZE SPOON 2
 SIZE THIN-WALLED TUBE _____ SIZE CORE _____
 N : NO. OF BLOWS TO DRIVE 2 "SPOON" WITH 140 LB. WEIGHT FALLING 30 PER BLOW
 C : NO. OF BLOWS TO DRIVE "CASING" WITH 15 LB. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850130871

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2615451-2
APPLICATION NO. _____
COUNTY Hudson
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-8 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 52,24C,21A,39, Block 284
3. DATE COMPLETED 2-14/89 DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.5 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY MIKE DANIELS #1423 Date 2/14/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

26-13455-2

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP | EMPIRE
SOILS INVESTIGATIONS INC | HOLE NO. <u>W-7</u> | | | | | | |
|-------------------------------------------------------------------------------|-----------|------------------|------------|---------|------|-------------------------------------------|----------------------------|-------|-----------------|-------------------------------------------|------------|--------------|--|
| 2/6 | 2:30 | 0-0 | 12-0 | Cloudy | 70° | | GRD. ELEV. _____ | | | | | | |
| FIELD LOG | | | | | | | 26-13455-2 | | | | | | |
| PROJECT <u>APL</u> | | | | | | | | | | | | | |
| LOCATION <u>Point of N.J.</u> | | | | | | | Sheet <u>1</u> of <u>1</u> | | | | | | |
| DEPTH OF SAMPLE | SAMPLE NO | BLOWS ON SAMPLER | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS | |
| | | 0-6 | 6-12 | 12-18 | N | | | | | | | | |
| 5-7 | 1 | 2 | 4 | | | 3 | 3 | | | WG 15 | | | |
| 10-12 | 2 | 1 | 1 | | | 1 | 1 | | | WP 10 | | | |
| <div>DRILLERS CLASSIFICATION</div> | | | | | | | | | | 0' to 10' Gravelly
Sand Fill
Gravel | | | |
| | | | | | | | | | | 10' to 12.0
Gravel | | | |
| | | | | | | | | | | E O H | | | |
| | | | | | | | | | | 12.0 | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| NOTATION: SIZE <u>AUGERS</u> / CASING <u>6 1/4</u> SIZE SPOON <u>2</u> | | | | | | | | | | | | | |
| SIZE THIN-WALLED TUBE _____ SIZE CORE _____ | | | | | | | | | | | | | |
| N = NO. OF BLOWS TO DRIVE 2 "SPOON 24" WITH 14 LB. WEIGHT FALLING 30 PER BLOW | | | | | | | | | | | | | |
| C = NO. OF BLOWS TO DRIVE "CASING" WITH 15 LB. WEIGHT FALLING PER BLOW | | | | | | | | | | | | | |
| FILL OUT BACK OF LOG AND SIGN YOUR NAME | | | | | | | | | | | | | |

WR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2615456-1
APPLICATION NO. _____
COUNTY Hudson
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-6 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 52, 24C, 21A, 39, Block 284
3. DATE COMPLETED 2/6/89 DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY MIKE DANIELS #1423 Date 2/14/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130874

26-15456-1

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP | EMPIRE
SOILS INVESTIGATIONS, INC. | HOLE NO. <u>W-6</u> |
|------------------|-------------|--------------|------------|---------|------|---------------------------------------------|---------------------|
| <u>2/7</u> | <u>4:30</u> | <u>0.0</u> | | | | | GRD. ELEV. _____ |
| FIELD LOG | | | | | | | <u>26-15456-1</u> |

PROJECT APL
LOCATION Ramsey NJ Sheet 1 of 1

| DEPTH OF SAMPLE | SAMPLE NO. | BLOWS ON SAMPLER | | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
|-----------------|------------|------------------|----------|----|----|----------|-------------------|----------|-------|-----------------|-------------------------------------|------------|--------------|
| | | 0 | 6 | 12 | 18 | N | | | | | | | |
| | | | | | | | | | | | 0' TO 3.5' | | |
| | | | | | | | | | | | Black gravel | | |
| | | | | | | | | | | | Gravel Fill | | |
| <u>5-7</u> | <u>1</u> | <u>1</u> | <u>2</u> | | | <u>1</u> | <u>2</u> | | | | <u>WB 12</u> | | |
| | | | | | | | | | | | 3.5 to 9.0 | | |
| | | | | | | | | | | | Br. F. MC | | |
| <u>10-12</u> | <u>1</u> | <u>2</u> | | | | <u>1</u> | <u>1</u> | | | | <u>WB 15</u> | | |
| | | | | | | | | | | | Some F gravel | | |
| | | | | | | | | | | | th. Silt (Fill) | | |
| | | | | | | | | | | | 9.0 to 12.0 | | |
| | | | | | | | | | | | Gravelly Clay & Silt | | |
| | | | | | | | | | | | Some Red Clay | | |
| | | | | | | | | | | | E 11 | | |
| | | | | | | | | | | | 12.0 | | |

NOTATION: SIZE AUGERS CASING 1 1/4 SIZE SPOON 2
SIZE THIN-WALLED TUBE _____ SIZE CORE _____

N : NO. OF BLOWS TO DRIVE "SPOON" WITH 14 lb. WEIGHT FALLING 30 PER BLOW
C : NO. OF BLOWS TO DRIVE "CASING" WITH 15 lb. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850130875

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2615457-4
APPLICATION NO. _____
COUNTY Hudson
COORD. 26.13.7.71

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-7 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 52, 24C, 21A, 39, Block 284
3. DATE COMPLETED 2/6/89 DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.2 Feet
5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY MIKE DANIELS #1423 Date 2/14/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130876

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2614494-8
APPLICATION NO. _____
COUNTY Middlesex
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 1-589
3. DATE COMPLETED _____ DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 14.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 4.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT: _____
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICK EMPSON Date 1/16/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130877

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 014495-0
APPLICATION NO. _____
COUNTY Middlesex
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-1A SURFACE ELEVATION 15.8' Feet
(Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED _____ DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 32.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 22.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT: .
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICK EMPSON #1312 Date 1/16/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130878

DWR-138A
1/88

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 2614496-4
APPLICATION NO. _____
COUNTY Middlesex
COORD. 26.13.7.73

WELL RECORD

1. OWNER American President Lines, Ltd. ADDRESS 1800 Harrison St., Oakland, California
Owner's Well No. W-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 1-5-89
3. DATE COMPLETED _____ DRILLER Empire Soils Investigations, Inc.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 12.0 Feet
5. CASING: Type PVC Diameter 4 Inches Length 2.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 Inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICK EMPSON #1312 Date 1/16/89

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130879

FOR MONITORING PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Co. d: 2613/36

PERMIT NO. 26-6284

APPLICATION NO.

COUNTY: Hudson

WELL RECORD

- OWNER: HICKENSACK MEADOWLANDS ADDRESS: ONE DEKOTE PARK PLAZA
Owner's Well No. 1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
- LOCATION: LOT: 33 Block: 283 Municipality: Kearny Town
- DATE COMPLETED: August 24, 1983 DRILLER: A.C. Schultes & Sons, Inc.
- DIAMETER Top: 6 inches Bottom: 6 inches TOTAL DEPTH: 35 Feet
- CASING Type: P.V.C. Diameter: 6 inches Length: 20 Feet
- SCREEN Type: P.V.C. Size of Opening: 020 Diameter: 6 inches Length: 18 Feet
Range in Depth: { Top: 15 Feet
Bottom: 35 Feet } Geologic Formation: _____
Tail Piece: Diameter: _____ inches Length: _____ Feet
- WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
- RECORD OF TEST: Date: _____ Yield: _____ Gallons per minute
Static water level before pumping: _____ Feet below surface
Pumping level: _____ feet below surface after _____ hours pumping
Drawdown: _____ Feet Specific Capacity: _____ Gals. per min. per ft. of drawdown
How pumped: _____ How measured: _____
Observed effect on nearby wells: _____
- PERMANENT PUMPING EQUIPMENT:
Type: _____ Mfrs. Name: _____
Capacity: _____ G.P.M. How Driven: _____ H.P.: _____ R.P.M.: _____
Depth of Pump in well: _____ Feet Depth of Footpiece in well: _____ Feet
Depth of Air Line in well: _____ Feet Type of Meter on Pump: _____ Size: _____ inches
- USED FOR: Monitoring AMOUNT: { Average: _____ Gallons Daily
Maximum: _____ Gallons Daily }
- QUALITY OF WATER: N/A Sample: Yes _____ No _____
Taste: N/A Odor: N/A Color: N/A Temp: N/A of.
- LOG: See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
- SOURCE OF DATA: Drillers Log
- DATA OBTAINED BY: A.C. Schultes & Sons, Inc./ Date: August 10, 1983
William Jefferys

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

A.C. SCHULTES & SONS, INC.

| GROUND | | SINGLE CASE WELL | | STATE PERMIT # | |
|------------------|--|-------------------------------------|--|----------------------------------------------|--|
| 3'0" LEVEL | | WELL LOG | | NAME OF OWNER | |
| Fill | | FEET FROM GROUND SURFACE
0 TO 18 | | Hackensack Meadowland Development Commission | |
| Peat | | 18-20 | | Job # 19595 | |
| Silty white sand | | 20-35 | | Location Kearny Landfill | |
| | | | | Well No. 1 | |
| | | | | Hrs. Pumped Blew 1 Hr. | |
| | | | | Capacity G.P.M. 7 | |
| | | | | Static Level 10'8" | |
| | | | | Pumping Level | |
| | | | | Specific Capacity | |
| | | | | Diameter of Well 6" | |
| | | | | Depth of Well (ground) 35 | |
| | | | | Length of Casing 20'0" | |
| | | | | Distance to Top of Packer (ft.) | |
| | | | | Type Screen PVC | |
| | | | | Size of Screen 6" | |
| | | | | Length of Screen 18'0" | |
| | | | | Top Screen Fitting Couple | |
| | | | | Bottom Screen Fitting Cap | |
| | | | | Blank | |
| | | | | Slot Size .020 | |
| | | | | Drilling Machine No. 6B | |
| | | | | Driller C. Krammer | |
| | | | | Gravel 1 | |
| | | | | Bags of Cement 2 | |
| | | | | Date Well Completed 8/24/83 | |

Rotary Table types: 1 Above ground level

Form DW-14-102
11/80

**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613726

PERMIT NO. 26-6285

APPLICATION NO. _____
Hudson
COUNTY _____

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS ONE DEKOTE PARK PLAZA
Owner's Well No. 2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED August 24, 1983 DRILLER A.C. Schultes & Sons, Inc.
4. DIAMETER: Top 6 inches Bottom 6 inches TOTAL DEPTH 35 Feet
5. CASING: Type P.V.C. Diameter 6 inches Length 20 Feet
6. SCREEN: Type P.V.C. Size of Opening 020 Diameter 6 inches Length 18 Feet
Range in Depth { Top 15 Feet
Bottom 35 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
Flow pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER N/A Sample: Yes _____ No _____
Taste N/A Odor N/A Color N/A Temp. N/A °F.
12. LOG See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY A. C. Schultes & Sons, Inc./ Date August 30, 1983
William Jefferys

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130882

A.C. SCHULTES & SONS, INC.

2013/50

| GROUND | | SINGLE CASE WELL | | STATE PERMIT # 20 000 | |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------|----------------------------------------------|--|
| | | WELL LOG | FEET FROM GROUND SURFACE 0 TO 9 | NAME OF OWNER | |
| TOTAL DEPTH - FT.
35'0" | <div style="text-align: center;">3'0" LEVEL</div> <div style="text-align: center;">6" CASING</div> <div style="text-align: center;">18'0" STRAINER</div> | Fill | | Hackensack Meadowland Development Commission | |
| | | Peat | 9-13 | Job # 19595 | |
| | | Silty sand | 13-29 | Location Kearny Landfill | |
| | | Reddish gray clay | 29-35 | Well No. 2 | |
| | | | | Hrs. Pumped Blew 1 Hr. | |
| | | | | Capacity G.P.M. 2 | |
| | | | | Static Level 12'6" | |
| | | | | Pumping Level | |
| | | | | Specific Capacity | |
| | | | | Diameter of Well 6" | |
| | | | | Depth of Well (ground) 35'0" | |
| | | | | Length of Casing 20'0" | |
| | | | | Distance to Top of Packer (gr.) | |
| | | | | Type Screen PVC | |
| | | | | Size of Screen 6" | |
| | | Length of Screen 18'0" | | | |
| | | Top Screen Fitting Couple | | | |
| | | Bottom Screen Fitting Cap | | | |
| | | Blank No | | | |
| | | Slot Size .020 | | | |
| | | Drilling Machine No. 6B | | | |
| | | Driller C. Kramer | | | |
| | | Gravel 1 | | | |
| | | Bags of Cement 2 | | | |
| | | Date Well Completed 8/24/83 | | | |
| | | | | | |
| | | | | | |

Rotary Table approx. 1 inch above ground level

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613756

PERMIT NO. 26-6286

APPLICATION NO.
Hudson

COUNTY

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS ONE DEKOTE PARK PLAZA
Owner's Well No. 3 SURFACE ELEVATION Feet
(Above mean sea level)
2. LOCATION Lot: Block: Municipality: Kearny Town
3. DATE COMPLETED August 24, 1983 DRILLER A.C. Schultes & Sons, Inc.
4. DIAMETER: Top 6 inches Bottom 6 inches TOTAL DEPTH 34 Feet
5. CASING: Type P.V.C. Diameter 6 inches Length 19 Feet
6. SCREEN: Type P.V.C. Size of Opening .020 Diameter 6 inches Length 18 Feet
- Range in Depth { Top 16 Feet
Bottom 34 Feet
- Geologic Formation
- Tail Piece: Diameter inches Length Feet
7. WELL FLOWS NATURALLY Gallons per minute at Feet above surface
Water rises to Feet above surface
8. RECORD OF TEST: Date Yield Gallons per minute
Static water level before pumping Feet below surface
Pumping level feet below surface after hours pumping
Drawdown Feet Specific Capacity Gals. per min. per ft. of drawdown
How pumped How measured
Observed effect on nearby wells
9. PERMANENT PUMPING EQUIPMENT:
Type Mfrs. Name
Capacity G.P.M. How Driven H.P. R.P.M.
Depth of Pump in well Feet Depth of Footpiece in well Feet
Depth of Air Line in well Feet Type of Meter on Pump Size inches
10. USED FOR Monitoring AMOUNT { Average Gallons Daily
Maximum Gallons Daily
11. QUALITY OF WATER N/A Sample: Yes No
Taste N/A Odor N/A Color N/A Temp. N/A OF.
12. LOG See Attached Are samples available?
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY A. C. Schultes & Sons, Inc. Date August 30, 1983
William Jefferys

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130884

A.C. SCHULTES & SONS, INC.

| GROUND | | 3' 0" LEVEL | SINGLE CASE WELL | STATE PERMIT NO. 1000 |
|--------|--|-----------------|--------------------------|----------------------------------------------|
| | | WELL LOG | FEET FROM GROUND SURFACE | NAME OF OWNER |
| | | Fill | 0 to 15 | Hackensack Meadowland Development Commission |
| | | Peat | 15-17 | Job # 19595 |
| | | Gray silty clay | 17-22 | Location Kearny Landfill |
| | | Silty clay pink | 22-35 | Well No. 3 |
| | | Gray | | Hrs. Pumped Blow 1 Hr. |
| | | | | Capacity G.P.M. 1 |
| | | | | Static Level 4' 5" |
| | | | | Pumping Level |
| | | | | Specific Capacity |
| | | | | Diameter of Well 6" |
| | | | | Depth of Well (ground) 34' 0" |
| | | | | Length of Casing 19' 0" |
| | | | | Distance to Top of Packer (gr.) |
| | | 6" CASING | | Type Screen PVC |
| | | | | Size of Screen 6" |
| | | | | Length of Screen 18' 0" |
| | | | | Top Screen Fitting Couple |
| | | | | Bottom Screen Fitting Cap |
| | | | | Blank |
| | | | | Slot Size .020 |
| | | | | Drilling Machine No. 6B |
| | | | | Driller C. Krammer |
| | | | | Gravel 1 |
| | | | | Bags of Cement 2 |
| | | | | Date Well Completed 8/24/83 |
| | | | | |
| | | | | |

Rotary table approx. 1' above ground level

**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613756

PERMIT NO 26-6287

APPLICATION NO _____
Hudson

COUNTY _____

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS ONE DEKOTE PARK PLAZA
Owner's Well No. 4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED August 24, 1983 DRILLER A.C. Schultes & Sons, Inc.
4. DIAMETER Top 6 inches Bottom 6 inches TOTAL DEPTH 35 Feet
5. CASING Type P.V.C. Diameter 6 Inches Length 20 Feet
6. SCREEN Type P.V.C. Size of Opening .020 Diameter 6 Inches Length 18 Feet
Range in Depth { Top 15 Feet
Bottom 35 Feet } Geologic Formation _____
Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER N/A Sample: Yes _____ No _____
Taste N/A Odor N/A Color N/A Temp. N/A °F.
12. LOG See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY A. C. Schultes & Sons, Inc. / William Jefferys Date August 30, 1983

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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STATE PERMIT #26-217

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613786

PERMIT NO. 26-8468-6

APPLICATION NO.

Hudson

COUNTY

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS 1 DE KORTE PLAZA
Owner's Well No. MW 1 SURFACE ELEVATION _____ Feet
(Always mean sea level)
2. LOCATION Lot: n/a Block: n/a Municipality: Kearny Town-Hackensack Landfill 1-A
3. DATE COMPLETED 6025086 DRILLER W.C. SERVICES, INC.
4. DIAMETER: Top 2-3/4 inches Bottom 2-3/4 inches TOTAL DEPTH 30 Feet
5. CASING: Type PVC Diameter 4 inches Length 125 Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 20 Feet
- Range in Depth { Top 10 Feet
Bottom 30 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY n/a Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 6-25-86 Yield 20 Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type n/a Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER n/a Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Turb. _____ °T.
12. LOG See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
- SOURCE OF DATA Drillers Log
13. DATA OBTAINED BY W. C. SERVICES, INC./Chris Martin Date 7-11-86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2E13786

PERMIT NO. 26-8469-4

APPLICATION NO. _____

COUNTY Hudson

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS 1 DE KORTE PLAZA
Owner's Well No. MW 2 SURFACE ELEVATION _____ Feet
2. LOCATION Lot: n/a Block: n/a Municipality: Kearny Town of Hackensack Landfill 1A
3. DATE COMPLETED 6-25-86 DRILLER W.C. SERVICES, INC.
4. DIAMETER: Top 8-3/4 inches Bottom 8-3/4 inches TOTAL DEPTH 30 Feet
5. CASING: Type PVC Diameter 4 inches Length 30 Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 20 Feet
Range in Depth { Top 10 Feet
Bottom 30 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY n/a Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 6-25-86 Yield 15 Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type n/a Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER n/a Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ of.
12. LOG See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY W.C. SERVICES, INC./Chris Martin Date 7-11-86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613786

PERMIT NO. 26-8470-8

APPLICATION NO. _____

COUNTY Hudson

WELL RECORD

1. OWNER HACKENSACK MEADOWLANDS ADDRESS 1 DE KORTE PLAZA
Owner's Well No. MW 3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: n/a Block: n/a Municipality: Kearny Town Hackensack Landfill 1A
3. DATE COMPLETED 6-25-86 DRILLER W.C. SERVICES, INC.
4. DIAMETER: Top 8-3/4 inches Bottom 8-3/4 inches TOTAL DEPTH 30 Feet
5. CASING: Type PVC Diameter 4 inches Length 12 1/2 Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 20 Feet
- Range in Depth { Top 10 Feet
Bottom 30 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY N/A Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 6-26-86 Yield 20 Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type N/A Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER N/A Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG See Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY W. C. SERVICES, INC./Chris Martin Date 7-11-86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613732.

PERMIT NO 26-7014

APPLICATION NO

COUNTY Hudson

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER MONSANTO COMPANY ADDRESS PENNSYLVANIA AVE.
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED _____ DRILLER Warren George Inc.
4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Boring Log 2
14. DATA OBTAINED BY Warren George, Inc. Date 11/26/84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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| | | |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| JOB LOCATION:
Monsanto
Kearny, N.J. | WARREN GEORGE, INC.
FOOT OF JERSEY AVENUE
P. O. BOX 413
JERSEY CITY, N.J. 07303
FOR: O H Materials | SHEET _____ OF _____
LOCATION Monsanto Kearny
HOLE NO. 3-D
LINE & STA. _____
OFFSET _____ |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|

| | | |
|--------------------------------------------------|---------------------|------------------------------|
| DEPTH _____ FT. _____ FT. CASING OUT DATE: _____ | DATE, START: _____ | GROUND ELEVATION _____ |
| DEPTH _____ FT. ALL CASING OUT DATE: _____ | DATE, FINISH: _____ | GROUND WATER ELEVATION _____ |

| | | |
|-------------------------------|------------------------------------|-------------------------|
| CASING O.D. Auger I.D. _____ | WEIGHT OF HAMMER 140 LBS. | HAMMER FALL _____ |
| SAMPLER O.D. _____ I.D. _____ | INSIDE LENGTH OF SAMPLER _____ IN. | CASING _____ SAMPLER 30 |
| DIAMOND BIT SIZE _____ | | |

| DEPTH REL. TO SURFACE | CASING BLOWS PER FOOT | SAMPLE NUMBER | SAMPLE DEPTHS ELEV. / FEET | SAMPLE RECOVERY | BLINDS PER 8" ON SAMPLER | | | DENSITY OR CONSIST. MOISTURE | PROFILE CHANGE DEPTH | FIELD IDENTIFICATION OF SOILS REMARKS | |
|-----------------------|-----------------------|---------------|----------------------------|-----------------|--------------------------|------|-------|------------------------------|----------------------|---------------------------------------|--|
| | | | | | 0-6 | 6-12 | 12-18 | | | | |
| 0 | | 1 | 0'-2' | | 16-34-44-53 | | | | | 0'-6' Misc. fill gravel cinders | |
| | | | | | | | | | | | |
| | | 2 | 7'-9' | | 25-50-50-50 | | | | | 6'-14' Br. red silty sand | |
| 10 | | | | | | | | | | 14'-16' Peat | |
| | | 3 | 14'-16' | | 2-3-5-6 | | | | | | |
| | | | | | | | | | | | |
| | | 4 | 21'-23' | | 23-50-50-50 | | | | | 16'-28' Grey Br. silty sand | |
| 20 | | | | | | | | | | 28'-30' Grey silt | |
| | | 5 | 28'-30' | | shaly | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8881-9

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

26.13

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-15 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 5/7/86 DRILLER CATOH Environmental Companies Inc.
4. DIAMETER: Top 2 Inches Bottom 2 Inches TOTAL DEPTH 20.0 Feet
5. CASING: Type stainless steel Diameter 2 Inches Length 7.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 Inches Length 15.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

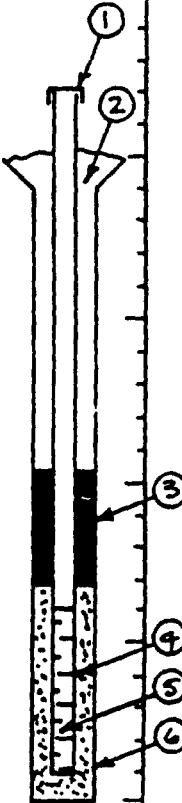
(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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26-13 76

26-5801

Project KOPPERS Site SEABOARD **BORING P-15** Sh 1 of 1
 Date Started 5/7/86 Completed _____ Ground Elevation _____
 Total Depth 20 FT. Location _____ Logged by FERLIN
 Casing I.D. _____ Contractor CATCH
 Remarks NO ODORS OR VISIBLE CONTAMINATION NOTED.

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|-------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|-----------------|-------------|-------|-------------|------------------------------------------|--------------------------------------------------------------------------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | Rec. | | | |
| | 0 | 4242
H2617 | 55 | 0-2 FT | 10in | | DRY BLACK CINDERS |  |
| | | 4245 | 5 | 2-4 FT | 15in. | | SAME | |
| | | 4245 | 5 | 4-6 FT | 12in. | | SAME, WET | |
| | | 4245 | 5 | 6-8 FT | 17in. | | CINDERS, TR. SLAG | |
| | | 4242
55 | 57 | 8-10 FT | 2 FT. | | SAME, WET | |
| | 10 | 4245 | 5 | 10-12 FT | 10in. | | SAME, WET. | |
| | | 4245 | 11 | 12-14 FT | 10in | | BROWN ORGANIC CLAY (PEAT) | |
| | | 4245 | 12 | 14-16 FT | 10in | | BROWN PEAT | |
| | | 4251
55 | 11 | 16-18 FT | 10in | | GRAY-BROWN FN.-MED. SAND, SOME SILT, WET | |
| | | 4242
55 | 12 | 18-20 FT | 12in | | GREEN-BROWN MED. SAND | |
| | 20 | | | | | | LT. BROWN CLAY, TR. SAND, V. SOFT, WET | |
| <div>① 2" STANDPIPE & CAP
② CEMENT COLLAR
③ BENTONITE SEAL
④ SAND PACK
⑤ WELL SCREEN
⑥ EDGE OF BORING</div> | | | | | | | | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613773

26-8842

PERMIT NO. _____

APPLICATION NO. _____
Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
- Owner's Well No. W-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 56 Block: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/14/86 DRILLER Catoh Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 14 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 6.0 Feet
6. SCREEN: Type Stainless Steel Size of Opening 10 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top 4.0 Feet
Bottom 14.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type NONE Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

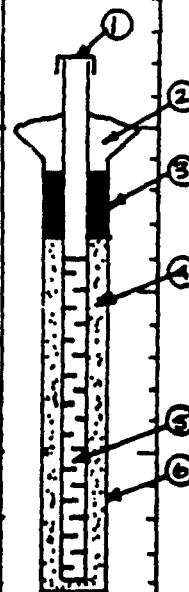
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26.13.793

Project KOPPER Site SEABOARD REAR, NJ BORING W-01 Sh 1 of 1
 Date Started 4/14/80 Completed _____ Ground Elevation _____
 Total Depth 14 FT. Location _____ Logged by HOLBING
 Casing I.D. _____ Contractor CATCH
 Remarks TAR OIL @ 0-4 FT. SHEEN ON GROUNDWATER @
4-6 FT. CONTINUOUS SPLIT-IRON SAMPLES

24-8849

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|---------------|-------------|-------------|-------------|--------------------------------------------------|---------------------|
| | | Type & Number | Blows per ft. | Depth Range | Rec. | | | |
| | 0 | | | | | | | |
| | | 2217 SS | | 0-2 FT. | | | LT. GRAY CINDERY FILL. TREE RESIDUE, SANDY | |
| | | 2211 SS | | 2-4 FT. | | | SAME, SILTY | |
| | 5 | 2212 SS | 22 | 4-6 FT. | | | CINDERY FILL | |
| | | SS | | 6-8 FT. | NO RECOVERY | | NO RECOVERY | |
| | 10 | 2213 SS | 11 | 8-10 FT. | | | CINDERY FILL | |
| | | 2209 SS | | 10-12 FT. | | | BROWN PEAT | |
| | | 2214 SS | | 12-14 FT. | | | BLUE-GREEN SILTY, MED-FN. SANDY CLAY (~80% CLAY) | |
| | 15 | | | | | | | |
| | 20 | | | | | | | |
| | 25 | | | | | | | |



- ① 2" STANDPIPE & CAP
- ② CEMENT COLLAR
- ③ BENTONITE SEAL
- ④ SAND PACK
- ⑤ WELL SCREEN
- ⑥ EDGE OF BORING

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 ⁷³

PERMIT NO. 26-8843

APPLICATION NO. _____
Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
- Owner's Well No. W-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 60 Block: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/15/86 DRILLER Catch Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 8.0 Feet
6. SCREEN: Type stainless steel Size of Opening 10 Diameter 2 Length 10.0 Feet
- Range in Depth { Top 6.0 Feet
Bottom 16.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type NONE Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130899

36.13.775

Project KOPERS Site SEABOARD Kearny, NJ **BORING** W-02 Sh 1 of 1
 Date Started 4/15/86 Completed _____ Ground Elevation _____
 Total Depth 18 FT. Location _____ Logged by HOLSING
 Casing I.D. _____ Contractor CATCH
 Remarks SHELBY TUBE SAMPLE PUSHED @ 16-18 FT. IN
CHEMICAL ODOES OR VISIBLE CONTAMINATION.

36. 3843

| Elev. Feet | Depth Feet | Samples | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|-------------|--------|-------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | Rec. | | | |
| | 0 | 19246 SS | | 0-2 FT | 1.5 FT | | BLACK CLUDERT, SANDY FILL DAMP, LOOSE | |
| | | 19337 SS | | 2-4 FT | 2.5 FT | | SAME, SOME RED SANDY MAT'L. WET. | |
| | 5 | 19338 SS | | 4-6 FT | | | SAME | |
| | | 19339 SS | | 6-8 FT | 1 FT | | SAME | |
| | | SS | | 8-10 FT | NONE | | BROWN STIFF PEAT | |
| | 10 | 19340 SS | | 10-12 FT | | | LT. GRAY SILT | |
| | | 19341 SS | | 12-14 FT | | | LT. BROWN MED.-C.E. SAND | |
| | 15 | 19342 SS | | 14-16 FT | | | | |
| | | SHELBY TUBE | | 16-18 FT | 18 in. | | V. STIFF GRAY CLAY | <p>① 2" STANDPIPE & CAP
 ② CEMENT COLLAR
 ③ BENTONITE SEAL
 ④ SAND PACK
 ⑤ WELL SCREEN
 ⑥ BORING</p> |
| | 20 | | | | | | | |
| | 25 | | | | | | | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137⁷³

26-6844

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
- Owner's Well No. W-4 SURFACE ELEVATION _____ Feet
2. LOCATION Lot: 62 Block: 287 Municipality: Kearny Town (Above mean sea level)
3. DATE COMPLETED 4/22/86 DRILLER Catch Environmental, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.0 Feet
5. CASING: Type Stainless steel Diameter 2 inches Length 12.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 7.0 Feet
- Range in Depth { Top 10.0 Feet
Bottom 17.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type NONE Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130901

2613.773

Project KOPERS Site SEABOARD KENT, NJ **BORING** W-04 Sh 1 of 1
 Date Started 4/22/86 Completed _____ Ground Elevation _____
 Total Depth 20 FT. Location _____ Logged by HOLSING
 Casing I.D. _____ Contractor CATCH
 Remarks NO ODORS OR CONTAMINATION NOTED. SHELBY TUBE
TAKEN @ 18-20 FT.

26-8544

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|-------------|------|-------------|-----------------------------------------------------------------------------------------------------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | Rec. | | | |
| | 0 | 1333 | 0-2 FT. | 1-5 FT. | | | BLACK CINDERY FILL, DAMP
4 IN. RED LAYER @ 2 FT. | |
| | | 3322 | 2-4 FT. | 1 FT. | | | BLACK GRANULAR CINDERY FILL
DAMP, V. LOOSE. | |
| | | 2747 | 4-6 FT. | 1 FT. | | | SAME | |
| | | 2223 | 6-8 FT. | NONE | | | | |
| | | 1111 | 8-10 FT. | WIN. | | | | |
| | 10 | 1217 | 10-12 FT. | | | | BROWN PEAT | |
| | | 79911 | 12-14 FT. | | | | LT. GRAY V. SL. CLAYEY SILTY,
FN. SAND, WET, COMPACT. | |
| | | 1215 | 14-16 FT. | 2 FT. | | | YELLOW FN. - MED. SAND, V. WET | |
| | | 1113 | 16-18 FT. | 2 FT. | | | DENSE LT. GRAY MED. - CSE SAND | |
| | | SHIRBY TUBE | 18-20 FT. | | | | GRAY FN. SAND, V. WET &
RUNNY | |
| | 20 | | | | | | SAME | |
| | | | | | | | V. STIFF BROWN CLAY, DAMP | |
| | | | | | | | SAME SHELBY TUBE @ 18-20 FT. | |
| | 25 | | | | | | ① 2" STANDPIPE & CAP
② CEMENT COLLAR
③ BENTONITE SEAL
④ SAND PACK
⑤ WELL SCREEN
⑥ EDGE OF BORING | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613773

26-8845

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

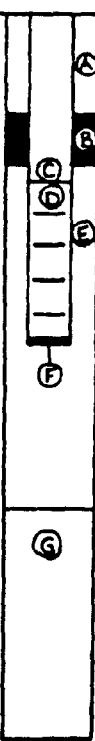
1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
- Owner's Well No. W-6 SURFACE ELEVATION _____ Feet
Lot: 60 Block: 287 Municipality: Kearny Town (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 4/23/86 DRILLER Catch Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 22.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 19.0' Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 12.0 Feet
Bottom 22.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type NONE Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130903

24.13.77-3

Project E043-200 Site SEABOARD **BORING** W-6 Sh 1 of 1
 Date Started 09/27/86 Completed 09/23/86 Ground Elevation _____
 Total Depth 22' Location MID-SITE Logged by M. LESSESKI
 Casing I.D. 2" Contractor CATCH
 Remarks 6" I.D. PROTECTIVE CASING WITH LOCKING CAP
 _____ 24-8845

| Elev.
Feet | Depth
Feet | Sample | | | | Graphic
Log | Sample Description | Equipment
Installed |
|---------------|---------------|------------------|-----------------------|----------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| | | Type &
Number | Blows
per
6 In. | Depth
Range
ft | Rec.
ft | | | |
| ▼ | 5 | SS1 | 4,3,3,4 | 0-2' | 2.' | | FILL: black/brown, cinders, brick, pitch,
concrete, compact (0-2');
loose (2-4.7'); poorly graded |  |
| | | SS2 | 5,4,5,4 | 2-4 | 1.25 | | | |
| | | SS3 | 2,1,2,1 | 4-6 | 2. | | | |
| | | SS4 | 1,1,2,1 | 6-8 | 1. | | | |
| | 10 | SS5 | 1,2,1,2 | 8-10 | 2. | | Organic, brown, fr clay, dense | |
| | | SS6 | 1/2, 1/2 | 10-12 | 1.17 | | | |
| | | SS7 | 1/2, 1/2 | 12-14 | 0.75 | | | |
| | 15 | SS8 | 1,4,10,10 | 14-16 | 1.5 | | fm SAND, lt. brown/gray, some silt,
dense (14.8-16' and 18-21'), compact
(16-18') | |
| | | SS9 | 9,18,15,18 | 16-18 | 2. | | | |
| | | SS10 | 9,8,12,14 | 18-20 | 2. | | | |
| | 20 | SS11 | | 20-22 | 2. | | CLAY, dk gray, dense, stiff, slight plasticity | |
| 25 | | | | | | A CONCRETE
B BENTONITE - REAL WYOMING
C 2" I.D. TYPE 304 SS RISER
D 2" I.D. TYPE 304 SS 10 SLOT RISER
E MORIE SAND
F BOTTOM CAP
G BACKFILL | | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613793

26-8846

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

KOPPERS COMPANY INC.

801 KOPPERS BLDG.

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. W-7 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 62 Block: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/24/86 DRILLER Catoh Environmental Co. Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 20.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 7.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 15.0 Feet
- Range in Depth { Top 5.0 Feet
Bottom 20.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130905

Project KOPPER Site SEABOARD KERRY, NJ **BORING** W-07 Sh 1 of 1
 Date Started 4/24/06 Completed _____
 Total Depth 20 FT. Location _____ Ground Elevation _____
 Casing I.D. _____ Contractor CATCH Logged by HOLSING
 Remarks SLIGHT - MODERATE COAL TAR ORR @ 0-8 FT. NO ORR
BELOW 8 FT. 0-1 FT. WAS MATERIAL GRADED INTO AREA BY BULLDOZER
TO MAKE ACCESS TO BORING LOCATION.

26.13 773

26-5846

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|---------------|------|-------------|---------------------------------------------------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | Rec. | | | |
| 0 | | M1247 SS | 4677 | 0-2 FT | * | | DRY BLACK FILL | |
| | | M1249 SS | 4779 | 2-4 FT | | | BLACK CINDERY FILL, DAMP | |
| 5 | | M1250 SS | 6554 | 4-6 FT | | | SAME, WET | |
| | | M1251 SS | 4322 | 6-8 FT | | | SAME, RED CINDERS | |
| | | SS | 4432 | 8-10 FT | | | SAME | |
| 10 | | M1252 SS | 5235 | 10-12 FT | | | SAME | |
| | | M1253 SS | 3221 | 12-14 FT | | | BROWN SANDY CINDERY FILL, V. WET | |
| 15 | | M1254 SS | 2222 | 14-16 FT | | | BLACK & RED CINDERY FILL, V. WET, SANDY | |
| | | M1255 SS | | 16-18 FT LFT. | | | BROWN STIFF PEAT, DAMP. | |
| | | M1256 SS | | 18-20 FT LFT. | | | LT. GRAY, W. SANDY SILT @ 17.5 TO SILTY FN. MED SAND @ 19 FT. | |
| 20 | | | | | | | BROWN STIFF CLAY | |
| 25 | | | | | | | | |

- ① 2" STANDPIPE & CAP
- ② CEMENT COLLAR
- ③ BENTONITE SEAL
- ④ SAND PACK
- ⑤ WELL SCREEN
- ⑥ EDGE OF BORING

* TWO SPLITS RUNS TAKEN @ 0-2 FT. FOR ADEQUATE SAMPLE.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 ⁷²

26-88477

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. W-11 SURFACE ELEVATION _____ Feet
2. LOCATION Lot: 70 Block: 287 Municipality: Kearny ^{APPROPRIATE FOR MONITORING PURPOSES ONLY.}
3. DATE COMPLETED 4/10/86 DRILLER CATCH Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 15.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 17.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top 5.0 Feet
Bottom 15.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

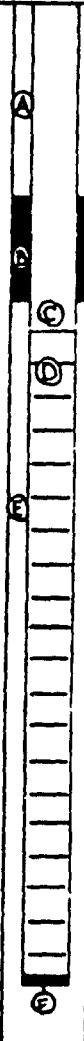
(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130907

26-13-773

Project E043-200 Site SEABOARD BORING W-11 Sh 1 of 1
 Date Started 04/09/86 Completed 04/09/86 Ground Elevation _____
 Total Depth 16' Location COKE/COAL STORAGE EAST Logged by M. LESSESKI
 Casing I.D. 2" Contractor CATON
 Remarks 6" ID PROTECTIVE CASING WITH LOCKING CAP

26-8847

| Elev.
Feet | Depth
Feet | Sample | | | | Graphic
Log | Sample Description | Equipment
Installed |
|---------------|---------------|------------------|-----------------------|----------------------|------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| | | Type &
Number | Blows
per
6 in. | Depth
Range
ft | Rec.
ft | | | |
| ▼ | 5 | | 11,9,3,4 | | | | FILL: Black,dk brown cinders,
brick, concrete, loose |  |
| | | SS1 | | 0-2' | 1.25' | | | |
| | | | 3,4,3,3 | | | | | |
| | | SS2 | | 2-4' | 1.25 | | | |
| | | | 9,4,3,3 | | | | | |
| | 10 | SS3 | | 4-6' | 1.67 | | cmf SAND and SILT,
black/dk brown, loose | |
| | | | 3,3,2,2 | | | | | |
| | | SS4 | | 6-8' | .08 | | | |
| | | | 4,3,4,4 | | | | | |
| | | SS5 | | 8-10' | 1.08 | | | |
| 15 | | 3,2,3,3 | | | | cmf SAND and GRAVEL, little silt
black, loose, poorly graded | | |
| | SS6 | | 10-12' | 2. | | | | |
| | | 2,3,2,2 | | | | | | |
| | SS7 | | 12-14' | .83 | | | | |
| | | 1,1,1,1 | | | | CLAY, black, compact, mod plasticity | | |
| SS8 | | 14-16' | 2. | | | | | |
| | | | | | | | A CONCRETE D 2" I.D. TYPE 304 SS 10 BLT
B BENTONITE E MORE SAND
REAL WYOMING F BOTTOM CAP
C 1" I.D. TYPE 304 SS RISER | |

A CONCRETE D 2" ID TYPE 304 SS 100WOT
 B BENTONITE E HORN SCREEN
 REAL WYOMING F BOTTOM CAP
 C 2" ID TYPE 304 SS RISER

ERT

ERT

ENVIRONMENTAL RESEARCH & TECHNOLOGY INC

850130908

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 ⁷³

PERMIT NO. 26-8848

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. W-12 SURFACE ELEVATION _____ Feet
2. LOCATION Lot: 70 Block: 287 Municipality: Kearny Town ^(Above mean sea level)
3. DATE COMPLETED 4/10/86 DRILLER Catch Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 8.0 Feet
6. SCREEN: Type steel Size of Opening _____ Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 6.0 Feet
Bottom 11.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130909

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 73

26-8849

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
- Owner's Well No. W-3 SURFACE ELEVATION _____ Feet
Lot: 62 Block: 287 Municipality: Kearny Twn (Above mean sea level)
2. LOCATION Catch Environmental Co., Inc.
3. DATE COMPLETED 4/22/86 DRILLER _____
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 12.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 7.0 Feet
- Range in Depth { Top 10.0 Feet
Bottom 17.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type NONE Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130910

Project KOPPER Site SEABOARD KENNY, NJ **BORING** W. 03 Sh 1 of 1
 Date Started 4/22/06 Completed _____
 Total Depth 18 FT. Location _____ Ground Elevation _____
 Casing I.D. _____ Logged by HOLSING
 Remarks BORING LOCATED @ EDGE OF OXIDE WASTE PILE. SLIGHT
CROSS SITE OROR @ 6-8 FT (@ BASE OF FILL). NO ORORS
BELOW PEAT.

26.13.1113

26-5849

| Elev. Feet | Depth Feet | Sample | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|----------------|-------------|---------------------------------------------------------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | | | |
| | 0 | 1220
SS | 1 2 2 | 0-2 FT. 1 FT. | ▼ | RED SANDY FILL @ 0-0.5 FT
OVER BLACK CINDERY FILL
WET @ ~2 FT | |
| | | SS | 2 2 2 | 2-9 FT 1.5 FT | | BLACK CINDERY FILL | |
| | | 1213
SS | 3 4 2 | 4-6 FT 1.5 FT. | | RED/ORANGE CINDERY FILL
BLACK CINDERY FILL | |
| | | SS | 2 2 2 | 6-8 FT 10 in. | | SAME | |
| | | 1214
SS | 2 3 3 | 8-10 FT 1 FT | | BROWN PEAT | |
| | | 1215
SS | 2 2 4 | 10-12 FT 1 FT. | | BROWN FN. SANDY SILT, STIFF
GRAY WELL SORTED MED. SAND | |
| | | SS | 7 10 14 | 12-14 FT 2 FT | | WET, RUNNY SILTY FN. SAND
STIFF, DAMP, GRAY MED. SAND | |
| | | 1216
SS | 6 9 5 | 14-16 FT | | SAME, WETTER | |
| | | 1217
SS | 11 14 13 | 16-18 FT | | SAME | |
| | | | | | | BROWN-GRAY CLAY | |
| | 20 | | | | | | |
| | 25 | | | | | | |

- ① 2" STANDPIPE & CAP
- ② CEMENT COLLAR
- ③ BENTONITE SEAL
- ④ SAND PACK
- ⑤ WELL SCREEN
- ⑥ EDGE OF BORING

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 ⁷³

26-8850

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

KOPPERS COMPANY INC.

801 KOPPERS BLDG.

1. OWNER _____ ADDRESS _____

Owner's Well No. W-5 SURFACE ELEVATION _____ Feet

2. LOCATION Lot: 62 Block: 287 Municipality: Kearny Town (above mean sea level)

3. DATE COMPLETED 4/23/86 DRILLER Catch Environmental Companies, Inc.

4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet

5. CASING: Type stainless steel Diameter 2 inches Length 7.0 Feet

6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet

Range in Depth { Top 5.0 Feet
Bottom 10.0 Feet

Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfr. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA ERT, Inc.

14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130912

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 ⁷³

26-8851

PERMIT NO. _____

APPLICATION NO. HUDSON

COUNTY _____

WELL RECORD

KOPPERS COMPANY INC.

801 KOPPERS BLDG.

1. OWNER _____ ADDRESS _____

Owner's Well No. W-2 SURFACE ELEVATION _____ Feet

2. LOCATION Lot: 70 Block: 287 Municipality: Kearny Town (Refer to map on see level)

3. DATE COMPLETED 4/15/86 DRILLER Catch Environmental Co., Inc.

4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet

5. CASING: Type stainless steel Diameter 2 Length 8.0 Feet

6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 10.0 Feet

Range in Depth { Top 6.0 Feet
Bottom 16.0 Feet } Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfrs. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA ERT, Inc.

14. DATA OBTAINED BY CATCH Environmental Companies Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130913

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613793

26-8852

PERMIT NO. _____

APPLICATION NO. Hudson

COUNTY _____

WELL RECORD

KOPPERS COMPANY INC.

801 KOPPERS BLDG.

1. OWNER _____ ADDRESS _____
Owner's Well No. W-10 SURFACE ELEVATION _____ Feet
Lot: 70 Block: 287 Municipality: Kearny (Assess on 100 level)
2. LOCATION _____
3. DATE COMPLETED 4/15/86 DRILLER Catch Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 8.0 Feet
6. SCREEN: Type stainless steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 6.0 Feet
Bottom 11.0 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA EFT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130914

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2613793

PERMIT NO. 26-8855

APPLICATION NO. _____

Hudson

COUNTY _____

WELL RECORD

1. OWNER KOOPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. W-8 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 70 Block: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/14/86 DRILLER Catch Environmental, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL 16.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 8.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top 6.0 Feet
Bottom 16.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT. Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130915

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.13.773
PERMIT NO. 26-8866-5

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. W-5A SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/28/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 21.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 5.0 Feet
6. SCREEN: Type SS Size of Opening 10 Diameter 2 inches Length 18.0 Feet
- Range in Depth { Top 13.0 Feet
Bottom 18.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 6/23/86

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130916

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13-773
PERMIT NO. 26-8867-3
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. P-11 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/18/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 13.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 11.0 Feet
Bottom 16.0 Feet Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130917

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

96-13-773
PERMIT NO. 26-8868-1
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. P-13 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT 62 BLOCK: 287 Municipality: Krarney Town
3. DATE COMPLETED 4/17/86 DRILLER CATON Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 13.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 11.0 Feet
Bottom 16.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130918

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 13 713
PERMIT NO. 26-8869-0

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS RD.
Owner's Well No. P-14 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/14/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 14.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 12.0 Feet
Bottom 17.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130919

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13-775
PERMIT NO. 26-8870-3
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. P-16 SURFACE ELEVATION _____ Feet
(Above mean sea level)
LOCATION LOT: 62 BLOCK: 287 Municipality: Keary Town
DATE COMPLETED 4/17/86 DRILLER CATON Environmental Companies, Inc.
METER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet
CASING: Type stainless steel Diameter 2 inches Length 13.0 Feet
SCREEN: Type stainless steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 11.0 Feet
Bottom 16.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130920

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

36 13 773
PERMIT NO. 26-8871-1

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. P-17 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/16/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 14.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 11.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 9.0 Feet
Bottom 14.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA EFT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130921

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

24 13 1986
PERMIT NO. 26-8872-2
APPLICANT'S NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-20 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Twp
3. DATE COMPLETED 4/17/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 14.00 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 11.0 Feet
6. SCREEN: Type stainless steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 9.0 Feet
Bottom 14.0 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130922

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8873-8

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-22 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/16/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 14.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 9.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 9.0 Feet
Bottom 14.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130923

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.13.773
PERMIT NO. 26-8875-4

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG.
Owner's Well No. P-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 56 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/16/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 6.5 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 5.0 Feet
Bottom 10.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130924

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8876-2

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

- 2413773
- OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
 - LOCATION LOT: 60 BLOCK: 287 Municipality: Kearny Town.
 - DATE COMPLETED 4/16/86 DRILLER CATON Environmental Companies, Inc.
 - DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0 Feet
 - CASING: Type stainless steel Diameter 2 inches Length 15.0 Feet
 - SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 13.0 Feet
Bottom 18.0 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
 - WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
 - RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
 - PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
 - USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
 - QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
 - LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
 - SOURCE OF DATA ERT, Inc.
 - DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130925

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13-173
PERMIT NO. 26-8878-9

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-8 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 60 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/23/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 13.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 11.0 Feet
Bottom 16.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG attached Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130926

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13 715
PERMIT NO. 26-8879-7

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 Municipality: Kearny Town
4/21/86
3. DATE COMPLETED 4/21/86 DRILLER CATON Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 15.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 13.0 Feet
Bottom 18.0 Feet Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130927

FOR MONITORING PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26137 93

PERMIT NO. 26-8948

APPLICATION NO. _____

COUNTY Hudson

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPE'S BLDG.
Owner's Well No. P-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 54 Block: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/23/86 DRILLER Catch Environmental Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 15.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 10.0 Feet
Bottom 15.0 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATCH Environmental Companies, Inc. Date 5/21/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130928

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.13.773

PERMIT NO. 26-08954-8

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-25A SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION _____ Municipality: Kearny Town
3. DATE COMPLETED 4/24/86 DRILLER CATOH Environmental Companies Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 ft
5. CASING: Type stainless steel Diameter 2 inches Length 7.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130929

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-08955-6

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-258 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION _____ Municipality: Kearny Town
3. DATE COMPLETED 4/25/86 DRILLER CATON Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 21.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 18.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 16.0 Feet
Bottom 21.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130930

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13 11/13
PERMIT NO 26-09427-4

APPLICATION NO _____

COUNTY HUDSON

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG., PITTSBURGH, PA 15219
Owner's Well No. W-13 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT 62 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/7/86 DRILLER CATCH ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top 4" inches Bottom 4" inches TOTAL DEPTH 78.0 Feet
5. CASING: Type PVC Diameter 4" inches Length 68.0 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4" inches Length 10.0 Feet
Range in Depth { Top 68.0' Feet
Bottom 78.0' Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA KEYSTONE ENVIRONMENTAL RESOURCES, INC. 10/7/86
14. DATA OBTAINED BY CATCH ENVIRONMENTAL COMPANIES, INC. Date 8/7/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130931

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-13-8-173

PERMIT NO 26-09428-2
APPLICATION NO _____
COUNTY HUDSON

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLVD PITTSBURGH PA 15219
Owner's Well No. W-14 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/5/86 DRILLER CATON ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top 16 inches Bottom 4 inches TOTAL DEPTH 56 Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR TEST BORING-BORING SEALED AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA KEYSTONE ENVIRONMENTAL RESOURCES, INC. 10/7/86
14. DATA OBTAINED BY CATON ENVIRONMENTAL COMPANIES, INC. Date 8/4 & 5/86

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130932

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-09432-1
PERMIT NO. 26-09432-1
APPLICATION NO. _____
COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG. PITTSBURGH, PA 15219
Owner's Well No. W-15 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 60 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/5/86 DRILLER CATON ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 89.5 Feet
5. CASING: Type PVC Diameter 4" inches Length 79.5 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4" inches Length 10.0 Feet
- Range in Depth { Top 79.5 Feet
Bottom 89.5 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If storage log was made, please furnish copy.)
13. SOURCE OF DATA KEYSTONE ENVIRONMENTAL RESOURCES, INC. 10/7/86
14. DATA OBTAINED BY CATON ENVIRONMENTAL COMPANIES, INC. Date 8/5/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130933

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

24-13 8/13
PERMIT NO 26-09433-9

APPLICATION NO _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG. PITTSBURGH, PA 15219
Owner's Well No. W-16 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/8/86 DRILLER CATCH ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top 16 inches Bottom 4 inches TOTAL DEPTH 41.0 Feet
5. CASING: Type PVC Diameter _____ inches Length _____ Feet
6. SCREEN: Type PVC Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING -WELL SEALED AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA KEYSTONE ENVIRONMENTAL RESOURCES, INC. 10/7/86
14. DATA OBTAINED BY CATCH ENVIRONMENTAL COMPANIES, INC. Date 8/8/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130934

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-15-793

PERMIT NO 26-09453

APPLICATION NO _____

COUNTY HUDSON

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG., PITTSBURGH, PA 15219
Owner's Well No. W-17 SURFACE ELEVATION _____ Feet:
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/12/86 DRILLER CATON ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 64.1 Feet
5. CASING: Type PVC Diameter 4 inches Length 54.1 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA KEYSTEON ENVIRONMENTAL RESOURCES, INC. 10/7/86
14. DATA OBTAINED BY CATON ENVIRONMENTAL COMPANIES, INC. Date 8/12/86

NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130935

WR-138
11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.13.793 ~~26.13.793~~

PERMIT NO. 2609471

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

1. OWNER KOPPERS COMPANY, INC. ADDRESS 801 KOPPERS BLDG. PITTSBURGH, PA 15219
Owner's Well No. W-18 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 62 BLOCK: 287 MUNICIPALITY: KEARNY TOWN
3. DATE COMPLETED 8/11/86 DRILLER CATOH ENVIRONMENTAL COMPANIES, INC.
4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR TEST BORING-BORING SEALED AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ of.
12. LOG SEE ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA CATOH Environmental Companies, Inc. 10/17/86
14. DATA OBTAINED BY CATOH ENVIRONMENTAL COMPANIES, INC. Date 8/11/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130936

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8880-1

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

26.13.75

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-12 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/21/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 7.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
Range in Depth { Top 5.0 Feet
Bottom 10.0 Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130937

26-13 75-

26-8830

Project EO43-200 Site SEABOARD **BORING** P-12 Sh 1 of 1
 Date Started 04/21/86 Completed 04/21/86 Ground Elevation _____
 Total Depth 12' Location CONCRETE AND GAS PROCESSING Logged by M. LESSESKI
 Casing I.D. 2" Contractor _____
 Remarks 6" I.D. PROTECTIVE CASING WITH LOCKING CAP

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|----------------|---------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range ft | Rec. ft | | | |
| | | SS1 | 7, 6, 14, 10 | 0-2' | 2' | | FILL: dk brown/black, pitch, coke; silt and fm sand (3-5'); compact (0-2'); loose (2-9.3'); poorly graded | A
B
C
D |
| | | SS2 | 4, 5, 7, 6 | 2-4' | 2. | | | |
| | 5 | SS3 | 3, 3, 3, 2 | 4-6' | 2. | | | |
| | | SS4 | 1, 2, 3, 1 | 6-8 | 1. | | | |
| | 10 | SS5 | 1, 2, 1, 1 | 8-10 | 1.5 | | Organic, dk brown, little clay, sulfur odor & lenses of pitch | E
F
G |
| | | SS6 | 1, 2, 1, 1 | 10-12 | 1. | | CLAY, brown, fr organic, compact, slight plasticity | |
| | 15 | | | | | | A CONCRETE
B BENTONITE-REAL WYOMING
C 2" I.D. TYPE 304 SS RISER
D 2" I.D. TYPE 304 SS 10 SLOT RISER
E MORIE SAND
F BOTTOM CAP
G BACKFILL | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8882-7

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

26.13.74

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLUG
Owner's Well No. P-18 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/18/86 DRILLER CATON Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 12.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 9.0 Feet
SCREEN: Type stainless steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

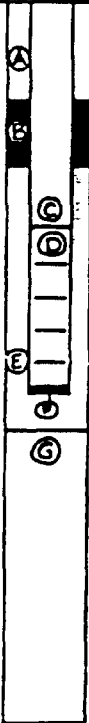
(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130939

26-13 16-

26-8882

Project E043-200 Site SEABOARD **BORING** P-18 Sh 1 of 1
 Date Started 04/17/86 Completed 04/18/86 Ground Elevation _____
 Total Depth 22' Location ONE RANTANNOCK ROCK Logged by M. LESSESKI
 Casing I.D. 2" Contractor CATCH
 Remarks 6" I.D. PROTECTIVE CASING WITH LOCKING CAP

| Elev.
Feet | Depth
Feet | Sample | | | | Graphic
Log | Sample Description | Equipment
Installed |
|---------------|---------------|------------------|-----------------------|----------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| | | Type &
Number | Blows
per
6 in. | Depth
Range
ft | Rec.
| | | |
| ▼ | 5 | SS1 | 7,7,14,8 | 0-2' | 2' | | FILL: Black/dk brown, cinders, coke, brick,
iron pellets, tr organics (0-2');
woodchips (4-6'); loose, poorly
graded, tr oil sheen in water (10-12') |  |
| | | SS2 | 6,5,4,6 | 2-4 | 2' | | | |
| | | SS3 | 4,5,5,4 | 4-6 | 2' | | | |
| | | SS4 | 3,3,2,2 | 6-8 | 2' | | | |
| | | SS5 | 3,3,3,3 | 8-10 | 2' | | | |
| | 10 | SS6 | 7,5,4,4 | 10-12 | 2' | | Organic, brown, little clay, slight
plasticity, sulfur odor | |
| | | SS7 | 4,1,1,4 | 12-14 | 2' | | | |
| | | SS8 | NR | 14-16 | 0 | | | |
| | | SS9 | 1,1,1,1 | 16-18 | 2' | | | |
| | | SS10 | 4,4,4,4 | 18-20 | 2' | | | |
| | 20 | SS11 | 2,3,2,2 | 20-22 | 2' | | SMP SAND, dk brown, loose
CLAY, gray (19.7-20'), rust (20-22'),
very dense, slight plasticity,
tr sand (20-22') | |
| | | | | | | | | |
| 25 | | | | | | A CONCRETE
B BENTONITE - REAL WYOMING
C 2" I.D. TYPE 304 SS RISER
D 2" I.D. TYPE 304 SS 10 SLOF RISER
E MORE SAND
F BOTTOM CAP
G BACKFILL | | |
| | | | | | | | | |

11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8883-5

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

26.13.74-

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-19 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/18/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 8.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 6.0 Feet
Bottom 11.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130941

26-13 14-

26-8823

Project EO43-200 Site SEABOARD **BORING** P-19 Sh 1 of 1
 Date Started 04/17/86 Completed 04/17/86 Ground Elevation _____
 Total Depth 14' Location OVER RAILROAD AND GAS PROCESSING Logged by M. LESSESKI
 Casing I.D. 2" Contractor CATCH
 Remarks 6" I.D. PROTECTIVE CASING WITH LOCKING CAP

| Elev.
Feet | Depth
Feet | Sample | | | | Graphic
Log | Sample Description | Equipment
Installed |
|---------------|---------------|------------------|-----------------------|----------------|------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| | | Type &
Number | Blows
per
6 in. | Depth
Range | Rec. | | | |
| | | SS1 | 2,0,20,20 | 0-2' | 2. | | FILL: dk brown/dk gray, cinders,
coke, brick, concrete, tr organics
(0-2'), iron pellets, poorly
graded, loose | A
B |
| | | SS2 | 15,30 | 2-3 | 1. | | | |
| | | SS3 | 39% | 4 | 0 | | | |
| | | SS4 | 2,2,1,1 | 6-8 | 2. | | SILT and cmf SAND, brown

Organic, brown, some clay, compact,
mod. plasticity, sulfur odor | C
D
E
F |
| | | SS5 | 2,1,1,3 | 8-10 | 1.5 | | | |
| | | SS6 | 1/2, 1/2 | 10-12 | 0.33 | | | |
| | | SS7 | 3/24 | 12-14 | 2. | | CLAY, brown, some organic, compact
mod. plasticity, sulfur odor | G |
| | | | | | | | A CONCRETE
B BENTONITE - REAL WYOMING
C 2" I.D. TYPE 304 SS RISER
D 2" I.D. TYPE 304 SS 10 SLOT RISER
E MORIE SAND
F BOTTOM CAP
G BACKFILL | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8884-3

WELL RECORD

APPLICATION NO. _____
COUNTY HUDSON

1. OWNER KOPPERS COMPANY INC. ADDRESS 601 KOPPERS BLUG
Owner's Well No. P-21 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/18/86 DRILLER CATON Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.5 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 15.0 Feet
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 13.5 Feet
Bottom 18.5 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATON Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130943

26-13 16-

26-8884

| | | | | | | | |
|-----------------------------------------------------------|--|--------------------------------------|--|------------------------------|--|------------------|--|
| Project <u>EO43-200</u> | | Site <u>SEABOARD</u> | | BORING <u>P-21</u> | | Sh 1 of <u>1</u> | |
| Date Started <u>04/16/86</u> | | Completed <u>04/17/86</u> | | Ground Elevation _____ | | | |
| Total Depth <u>20'</u> | | Location <u>COR/CEN STORAGE EAST</u> | | Logged by <u>M. LESSESKI</u> | | | |
| Casing I.D. <u>2"</u> | | Contractor <u>CATON</u> | | | | | |
| Remarks <u>4" I.D. PROTECTIVE CASING WITH LOCKING CAP</u> | | | | | | | |

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|------------|------------|---------------|-----------------|----------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range ft | Rec. ft | | | |
| ▼ | 5 | SS1 | 2,5 | 0-1' | 1. | | FILL: dk brnry/black, cinders, brick concrete, loose; pitch (6-10")
oil sheen in water (8-12");
pitch (16-18') | |
| | | SS2 | 6,6,6,7 | 2-4' | 2. | | | |
| | | SS3 | 6,1,5 | 4-5.5 | 1.5 | | | |
| | | SS4 | 6,6,6,6 | 6-8 | 2. | | | |
| | | SS5 | 6,8,10,10 | 8-10 | 2. | | | |
| | | SS6 | 12,8,5,5 | 10-12 | 2. | | | |
| | | SS7 | 8,8,6,6 | 12-14 | 2. | | | |
| | | SS8 | 4,3,4,4 | 14-16 | 2. | | | |
| | | SS9 | 1,3,1,1 | 16-18 | 2. | | | |
| | | SS10 | 3,3,3,4 | 18-20 | 2. | | | |
| | | | | | | CLAY, brown, organic, compact, mod. plasticity | | |
| | | | | | | A CONCRETE
B BENTONITE - REAL WYOMING
C 2" I.D. TYPE 304 SS RISER
D 2" I.D. TYPE 304 SS 10 SLOT RISER
E MORIC SAND
F BOTTOM CAP | | |

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. 26-8886-0

APPLICATION NO. _____

COUNTY HUDSON

WELL RECORD

26.13.74-

1. OWNER KOPPERS COMPANY INC. ADDRESS 801 KOPPERS BLDG
Owner's Well No. P-24 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 70 BLOCK: 287 Municipality: Kearny Town
3. DATE COMPLETED 4/14/86 DRILLER CATOH Environmental Companies, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0 Feet
5. CASING: Type stainless steel Diameter 2 inches Length 15.0 Feet
stainless
6. SCREEN: Type steel Size of Opening 10 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top 13.0 Feet
Bottom 18.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NCHE Mfr's. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA ERT, Inc.
14. DATA OBTAINED BY CATOH Environmental Companies, Inc. Date 5/23/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130945

26 13 16 -

26-8886

| | | | | | | | |
|-----------------------------------------------------------|--|--------------------------------------------|--|------------------------------|--|------------------|--|
| Project <u>E043-200</u> | | Site <u>SEABOARD</u> | | BORING <u>P-24</u> | | Sh 1 of <u>1</u> | |
| Date Started <u>04/11/86</u> | | Completed <u>04/14/86</u> | | Ground Elevation _____ | | | |
| Total Depth <u>19'</u> | | Location <u>ONE PLANT + GAS PROCESSING</u> | | Logged by <u>M. LESSECKI</u> | | | |
| Casing I.D. <u>2"</u> | | Contractor <u>CATCH</u> | | | | | |
| Remarks <u>6" I.D. PROTECTIVE CASING WITH LOCKING CAP</u> | | | | | | | |

| Elev. Feet | Depth Feet | Sample | | | | Graphic Log | Sample Description | Equipment Installed |
|---------------------|------------|---------------|-----------------|-------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|
| | | Type & Number | Blows per 6 in. | Depth Range | # Rec. | | | |
| 5
10
15
20 | | SS1 | 2,3,4,3 | 0-2' | 2. | <p>FILL: dk brown, cinders, pitch, brick, tr limestone; tr organics (0-2'); oily sheen to water (6-16'); compact</p> <p>GRAVEL and CLAY, black, tr organics, all present</p> <p>CLAY, brown, tr organics, sulfur odor</p> <p>A CONCRETE
B BENTONITE - REAL WYOMING
C 2" I.D TYPE 304 SS RISER
D 2" I.D TYPE 304 SS 10 SLOT RISER
E MORIE SAND
F BOTTOM CAP</p> | | |
| | | SS2 | 4,3,2,4 | 2-4' | 2. | | | |
| | | SS3 | 3,4,4,5 | 4-6' | 2. | | | |
| | | SS4 | 5,4,3,3 | 6-8' | 2. | | | |
| | | SS5 | 2,3,5,5 | 8-10' | 2. | | | |
| | | SS6 | 5,5,7,6 | 10-12' | 2. | | | |
| | | SS7 | 5,5,3,3 | 12-14' | 0.33 | | | |
| | | SS8 | 1,1,1,1 | 14-16' | 0.33 | | | |
| | | SS9 | 1, 1/2, 1 | 16-18' | 2. | | | |
| | | SS10 | 1/2 | 18-19' | 1. | | | |

850130947

Form DWR-138
11/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

CONC'D 2-17-84

PERMIT NO. 24-36,20-2

APPLICATION NO. _____

COUNTY Union

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
Owner's Well No. MW 4501A SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 5-11-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches - Bottom 2 inches TOTAL DEPTH 19' Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 5.5 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .020" Diameter 2 inches Length 13.5 Feet
- Range in Depth { Top 5.5 Feet
Bottom 19.0 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTING CRAIG TEST BORING CO. Date 5-11-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)067
2 1984

850130948

FD-302
11-82

BORING REPORT

26-13-14t.
26-66-21-3

| | | | | |
|-----------------------------------------------|--------------------------------|---------------------------------------------|---------------------------------|------------------------|
| PROJECT
KAPROWSKI RD | | NAME OF CONTRACTOR
TESTWELL-CRAIG | BORING NO.
MW 4501 A | DATE
5-10-84 |
| LOCATION
PORT ELIZABETH T10, 544+60 | | CONTRACT NO.
MF107 749 | SURFACE ELEV.
5-10-84 | |
| SPRNG
3 2.0.2 3/4" | CASING SIZE
6" AUGER | GROUND WATER LEVEL | | |
| NUMBER
140 1/2 IN 30 | NUMBER
300 1/2 IN 24 | DATE
5/10/84 | TIME
10:00 | DEPTH
6.2' |
| DRILLER
JOHN COYLE | | REMARKS
AUGER DOWN 10.5' | | |
| INSPECTOR
JOHN VARRONE - DOUG HOWE | | | | |

| CASING
BLOWS/FT. | DEPTH | SPOON
BLOWS/6" | RE-
COR'D | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
|---------------------|-------|-------------------|--------------|--------------|--------------------------------------------------------------------|
| H | 0 | 7-16 | 17" | 1 | M-F BR SAND, TO SILT, TO GRAVEL, TO VEG. |
| 1 | | 2 | | | |
| 2 | | 15-24 | 18" | 2 | SAME |
| 3 | | 31-43 | 16" | 3 | M-F BR SAND, TO SILT, TO GRAVEL |
| 4 | | 50 | | 4A | SAME as above |
| 5 | 5 | 43-38 | 15" | 4B | Red Brown clayey SILT, LITTLE gravel, 100' m-f sand |
| 6 | | 12-8 | 14" | 5 | Red Brown clayey SILT & C-F sand, some gravel & Red Shale |
| 7 | | 2-4 | 11" | 6 | C-F Red Brown Sand, and clayey SILT, LITTLE gravel |
| 8 | | 2-4 | 16" | 7A | C-F Red Brown Sand, some gravel, LITTLE SILT |
| 9 | 10 | 9-20 | 6" | 7B | Refuse Fill (wood, paper, sand, plastic, metal, etc) |
| 10 | | 35-14 | 10" | 8 | Refuse Fill (paper, metal, gravel, sand, glass, etc) |
| 11 | | 3-2-2 | 12" | 9 | Mixed Refuse (wood, paper, plastic, etc) mixed with SAND TO GRAVEL |
| 12 | 15 | 12-69 | 10" | 10 | SAME |
| 13 | | 12-69 | 10" | 11 | Refuse Fill (Rubber, wood, glass, plastic, paper, etc) |
| 14 | | 12-69 | 10" | 12 | Refuse Fill (Rubber, sand, paper, plastic, etc) |
| 15 | | 12-69 | 10" | 13 | Mixed Refuse (Paper, wood, plastic, etc) some Gray Clayey Sand |
| 16 | 20 | 12-69 | 10" | 14 | Two different layers of same |
| 17 | | 12-69 | 10" | | Brown Red, Top Refuse Fill (Rubber) |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | | | | |
| 29 | | | | | |
| 30 | | | | | |

Bottom of Boring 21.0 ft

NOTES:

1. Length recorded: 6" - Line of Sample, T - Top and
 2. Bottom of Sample, A - Auger, B - Spoon, C - Core and red, V - vein
 3. For description of symbols, see back of report.

850130949

Form OWR-138
1/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES13748
COOL: 2-137-16PERMIT NO. 40-564-6
APPLICATION NO. _____
COUNTY _____**FOR MONITORING
PURPOSES ONLY****WELL RECORD**

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
- Owner's Well No. MW-4401 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Loc: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 5-9-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 20' Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 7 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .020" Diameter 2 inches Length 12 Feet
- Range in Depth { Top 7 Feet
Bottom 19' Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR COMPUTER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? YES
(Also details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TECHNICAL TEST BUREAU CO. Date 5-9-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130950

26-13-745

26-6641-k

BORING REPORT

| | | | |
|----------------------------------------------|---------------------------------------------|------------------------------|-----------------------------------|
| PROJECT
KAPKOWSKI RD | NAME OF CONTRACTOR
TESTWELL-CRAIG | BORING NO.
MW 4401 | SURFACE ELEV.
 |
| LOCATION
PORT ELIZABETH T1-0, S440 | CONTRACT NO.
MF 107.749 | DATE
5-9-84 | |
| SPOON
3 2 2 3/4 | CASING SIZE
300 2 1/2 | GROUND WATER LEVEL | |
| DRILLER
JOHN COYLE | INSPECTOR
JOHN VARRONE-DOUG HOWE | DATE
5-9 | TIME
1:45 |
| | | DEPTH
7.5' | REMARKS
WATER IN SAMPLE |
| | | DATE
5-10 | TIME
7:10 |
| | | DEPTH
10.0' | REMARKS
WATER DOWN 16' |

| CASING
BLOWS/FT. | DEPTH | SPOON
BLOWS/6" | RE-
COR'D | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE | |
|---------------------|-------|-------------------|--------------|--------------|--------------------------------------------------------------------|------|
| 1 | 0 | 4-12 | 12" | 1 | M-F BROWN SAND TR GRAVEL TR SILT | |
| 2 | | 19 | | | | |
| 3 | | 22 | | | | |
| 4 | | 24-32 | 13' | 2 | SAME | |
| 5 | | 44-44 | 18" | 3 | SAME | |
| 6 | | 36 | | | | 4.7 |
| 7 | | 27 | | | | |
| 8 | 5 | 32-39 | 16" | 4 | RED BR CLAYEY SILT, BROWN M-F BR SAND TR GRAVEL | |
| 9 | | 20-12 | 17" | 5 | RED BR CLAYEY SILT, SAME M-F BR SAND TR GRAVEL TR SILT | |
| 10 | | 14 | | | | |
| 11 | | 2-2 | 15" | 6 | C-F RED BR SAND, SOME GRAVEL TR CLAYEY SILT | |
| 12 | | 1-2 | 17" | 7 | SAME | |
| 13 | 10 | 4-9 | 18" | 8A | SAME | 11.5 |
| 14 | | 71-114 | 12" | 9 | MIXED REFUSE (PLASTIC, WOOD, PAPER, ETC.) | |
| 15 | | 300-5 | 6" | 10 | MIXED REFUSE (WOOD, RUBBER, PAPER, ETC.) TR GRAVEL | |
| 16 | | 3-15 | 8" | 11 | MIXED REFUSE (PAPER, ETC.) TR GRAY ORGANIC SILTY CLAY | |
| 17 | | 8-20 | 16" | 12 | MIXED REFUSE (PAPER, WOOD, GRASS, PLASTIC, ETC.) | |
| 18 | | 19-14 | 12" | 13 | MIXED REFUSE (PAPER, WOOD, GRASS, ETC.) TR GRAY ORGANIC SILTY CLAY | |
| 19 | | 35-25 | 15" | 14B | BROWN PEAT | 20.0 |
| 20 | | | | | | 21.0 |
| 21 | | | | | | |
| 22 | | | | | | |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |
| 27 | | | | | | |
| 28 | | | | | | |
| 29 | | | | | | |
| 30 | | | | | | |

Bottom of Borehole

850130951

Form DWR-138
11/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COUNTY 20-6512-4

PERMIT NO. 20-6512-4

APPLICATION NO. _____

COUNTY _____

FOR INFORMATION
PURPOSES ONLY

WELL RECORD

1. OWNER PORT AUTHORITY OF NJ & NY ADDRESS FIRST & RIVER ST.
Owner's Well No. HW-4601 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 5-15-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17 Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 8.5 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .030" Diameter 2 inches Length 8.5 Feet
- Range in Depth { Top 8.5 Feet
Bottom 17 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? YES
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTING CRAIG TEST BORING CO. Date 5-15-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

CC # 223

22. 13 7.18

26-1442 - 4

NOTES: 1 - Length recovered; 0° - Loss of Sample, Y - Trap used
2 - U = undisturbed; A = apex; GER = open and red; Y = young

850130953

Form DWR-138
11/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

LOG # 2613716

PERMIT NO. 26-60411-2

APPLICATION NO. _____

COUNTY _____

**FOR MONITORING
PURPOSES ONLY**WELL RECORD

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
- Owner's Well No. MW 4801 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Loc: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 5-16-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.5 Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 9.0 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .020" Diameter 2 inches Length 8.5 Feet
- Range in Depth { Top 9.0 Feet
Bottom 17.5 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? YES
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTWELL CRAIG TEST BORING CO. Date 5-16-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

CC # 224

26 6-6-43 2

NOTES: 1 - Length recovered; 0° - Loss of length; T - Tey used
0 - No data; A - 2 years; C - 3 years and up; V - 4 years

Form DWR-128
11/80**FOR MONITORING
PURPOSES ONLY**STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES2613748
COUNTY: 2013748

PERMIT NO. 26-5008-0

APPLICATION NO. _____

COUNTY _____

WELL RECORD

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
Owner's Well No. AW-5008 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 3-18-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 12 Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 3.5 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .030" Diameter _____ inches Length 0.5 Feet
- Range in Depth { Top 3.5 Feet
Bottom 12.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTER'S CRAIG TEST BORING CO. Date 3-10-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

027
284

850130956

BORING REPORT

| PROJECT
KAPROWSKI RD | | NAME OF CONTRACTOR
TESTWELL-ORRIG | | BORING NO.
5008 | SHEET
1 |
|--------------------------------------------|-----------------------------|---------------------------------------------|--------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOCATION
PORT ELIZABETH | | CONTRACT NO.
MS 117 7-11 | | DATE
3-13-74 | |
| SPRNG
3 | CASING SIZE
3" ID | GROUND WATER LEVEL | | | |
| WABER
140 | WABER
300 | Date
3-13-74 | Time
800 | Depth
44' | Remarks |
| DRILLER
JOHN COYLE | | | | | |
| INSPECTOR
JOHN VARRONI BILL ROSE | | | | | |
| CASING
BLDS/FT. | DEPTH | SPOON
BLOWS/6" | RE-
COVD | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
| | 3 | 3-18 | 16" | 1 | Full |
| | 3-18 | | | | M-F BROWN SAND, LITTLE GR. T. GRAVEL T. 1 |
| | 3-18 | | | | |
| | 34-40 | 18 | | 2 | M-F BROWN SAND, LITTLE GR. T. GRAVEL |
| | 21-48 | 16 | | 3 | SAND AS 21-48 |
| | 21-48 | | | | |
| | 22-54 | 12 | | 4 | SAND AS 21-48 |
| | 41-52 | 10 | | 5 | M-F GRAY SAND TR. 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-1222-1223-1224-1225-1226-1227-1228-1229-1230-1231-1232-1233-1234-1235-1236-1237-1238-1239-1240-1241-1242-1243-1244-1245-1246-1247-1248-1249-1250-1251-1252-1253-1254-1255-1256-1257-1258-1259-1260-1261-1262-1263-1264-1265-1266-1267-1268-1269-1270-1271-1272-1273-1274-1275-1276-1277-1278-1279-1280-1281-1282-1283-1284-1285-1286-1287-1288-1289-1290-1291-1292-1293-1294-1295-1296-1297-1298-1299-1300-1301-1302-1303-1304-1305-1306-1307-1308-1309-1310-1311-1312-1313-1314-1315-1316-1317-1318-1319-1320-1321-1322-1323-1324-1325-1326-1327-1328-1329-1330-1331-1332-1333-1334-1335-1336-1337-1338-1339-1340-1341-1342-1343-1344-1345-1346-1347-1348-1349-1350-1351-1352-1353-1354-1355-1356-1357-1358-1359-1360-1361-1362-1363-1364-1365-1366-1367-1368-1369-1370-1371-1372-1373-1374-1375-1376-1377-1378-1379-1380-1381-1382-1383-1384-1385-1386-1387-1388-1389-1390-1391-1392-1393-1394-1395-1396-1397-1398-1399-1400-1401-1402-1403-1404-1405-1406-1407-1408-1409-1410-1411-1412-1413-1414-1415-1416-1417-1418-1419-1420-1421-1422-1423-1424-1425-1426-1427-1428-1429-1430-1431-1432-1433-1434-1435-1436-1437-1438-1439-1440-1441-1442-1443-1444-1445-1446-1447-1448-1449-1450-1451-1452-1453-1454-1455-1456-1457-1458-1459-1460-1461-1462-1463-1464-1465-1466-1467-1468-1469-1470-1471-1472-1473-1474-1475-1476-1477-1478-1479-1480-1481-1482-1483-1484-1485-1486-1487-1488-1489-1490-1491-1492-1493-1494-1495-1496-1497-1498-1499-1500-1501-1502-1503-1504-1505-1506-1507-1508-1509-1510-1511-1512-1513-1514-1515-1516-1517-1518-1519-1520-1521-1522-1523-1524-1525-1526-1527-1528-1529-1530-1531-1532-1533-1534-1535-1536-1537-1538-1539-1540-1541-1542-1543-1544-1545-1546-1547-1548-1549-1550-1551-1552-1553-1554-1555-1556-1557-1558-1559-1560-1561-1562-1563-1564-1565-1566-1567-1568-1569-1570-1571-1572-1573-1574-1575-1576-1577-1578-1579-1580-1581-1582-1583-1584-1585-1586-1587-1588-1589-1590-1591-1592-1593-1594-1595-1596-1597-1598-1599-1600-1601-1602-1603-1604-1605-1606-1607-1608-1609-1610-1611-1612-1613-1614-1615-1616-1617-1618-1619-1620-1621-1622-1623-1624-1625-1626-1627-1628-1629-1630-1631-1632-1633-1634-1635-1636-1637-1638-1639-1640-1641-1642-1643-1644-1645-1646-1647-1648-1649-1650-1651-1652-1653-1654-1655-1656-1657-1658-1659-1660-1661-1662-1663-1664-1665-1666-1667-1668-1669-1670-1671-1672-1673-1674-1675-1676-1677-1678-1679-1680-1681-1682-1683-1684-1685-1686-1687-1688-1689-1690-1691-1692-1693-1694-1695-1696-1697-1698-1699-1700-1701-1702-1703-1704-1705-1706-1707-1708-1709-1710-1711-1712-1713-1714-1715-1716-1717-1718-1719-1720-1721-1722-1723-1724-1725-1726-1727-1728-1729-1730-1731-1732-1733-1734-1735-1736-1737-1738-1739-1740-1741-1742-1743-1744-1745-1746-1747-1748-1749-1750-1751-1752-1753-1754-1755-1756-1757-1758-1759-1760-1761-1762-1763-1764-1765-1766-1767-1768-1769-1770-1771-1772-1773-1774-1775-1776-1777-1778-1779-1780-1781-1782-1783-1784-1785-1786-1787-1788-1789-1790-1791-1792-1793-1794-1795-1796-1797-1798-1799-1800-1801-1802-1803-1804-1805-1806-1807-1808-1809-1810-1811-1812-1813-1814-1815-1816-1817-1818-1819-1820-1821-1822-1823-1824-1825-1826-1827-1828-1829-1830-1831-1832-1833-1834-1835-1836-1837-1838-1839-1840-1841-1842-1843-1844-1845-1846-1847-1848-1849-1850-1851-1852-1853-1854-1855-1856-1857-1858-1859-1860-1861-1862-1863-1864-1865-1866-1867-1868-1869-1870-1871-1872-1873-1874-1875-1876-1877-1878-1879-1880-1881-1882-1883-1884-1885-1886-1887-1888-1889-1890-1891-1892-1893-1894-1895-1896-1897-1898-1899-1900-1901-1902-1903-1904-1905-1906-1907-1908-1909-1910-1911-1912-1913-1914-1915-1916-1917-1918-1919-1920-1921-1922-1923-1924-1925-1926-1927-1928-1929-1930-1931-1932-1933-1934-1935-1936-1937-1938-1939-1940-1941-1942-1943-1944-1945-1946-1947-1948-1949-1950-1951-1952-1953-1954-1955-1956-1957-1958-1959-1960-1961-1962-1963-1964-1965-1966-1967-1968-1969-1970-1971-1972-1973-1974-1975-1976-1977-1978-1979-1980-1981-1982-1983-1984-1985-1986-1987-1988-1989-1990-1991-1992-1993-1994-1995-1996-1997-1998-1999-2000-2001-2002-2003-2004-2005-2006-2007-2008-2009-2010-2011-2012-2013-2014-2015-2016-2017-2018-2019-2020-2021-2022-2023-2024-2025-2026-2027-2028-2029-2030-2031-2032-2033-2034-2035-2036-2037-2038-2039-2040-2041-2042-2043-2044-2045-2046-2047-2048-2049-2050-2051-2052-2053-2054-2055-2056-2057-2058-2059-2060-2061-2062-2063-2064-2065-2066-2067-2068-2069-2070-2071-2072-2073-2074-2075-2076-2077-2078-2079-2080-2081-2082-2083-2084-2085-2086-2087-2088-2089-2090-2091-2092-2093-2094-2095-2096-2097-2098-2099-2100-2101-2102-2103-2104-2105-2106-2107-2108-2109-2110-2111-2112-2113-2114-2115-2116-2117-2118-2119-2120-2121-2122-2123-2124-2125-2126-2127-2128-2129-2130-2131-2132-2133-2134-2135-2136-2137-2138-2139-2140-2141-2142-2143-2144-2145-2146-2147-2148-2149-2150-2151-2152-2153-2154-2155-2156-2157-2158-2159-2160-2161-2162-2163-2164-2165-2166-2167-2168-2169-2170-2171-2172-2173-2174-2175-2176-2177-2178-2179-2180-2181-2182-2183-2184-2185-2186-2187-2188-2189-2190-2191-2192-2193-2194-2195-2196-2197-2198-2199-2200-2201-2202-2203-2204-2205-2206-2207-2208-2209-2210-2211-2212-2213-2214-2215-2216-2217-2218-2219-2220-2221-2222-2223-2224-2225-2226-2227-2228-2229-2230-2231-2232-2233-2234-2235-2236-2237-2238-2239-2240-2241-2242-2243-2244-2245-2246-2247-2248-2249-2250-2251-2252-2253-2254-2255-2256-2257-2258-2259-2260-2261-2262-2263-2264-2265-2266-2267-2268-2269-2270-2271-2272-2273-2274-2275-2276-2277-2278-2279-2280-2281-2282-2283-2284-2285-2286-2287-2288-2289-2290-2291-2292-2293-2294-2295-2296-2297-2298-2299-2300-2301-2302-2303-2304-2305-2306-2307-2308-2309-2310-2311-2312-2313-2314-2315-2316-2317-2318-2319-2320-2321-2322-2323-2324-2325-2326-2327-2328-2329-2330-2331-2332-2333-2334-2335-2336-2337-2338-2339-2340-2341-2342-2343-2344-2345-2346-2347-2348-2349-2350-2351-2352-2353-2354-2355-2356-2357-2358-2359-2360-2361-2362-2363-2364-2365-2366-2367-2368-2369-2370-2371-2372-2373-2374-2375-2376-2377-2378-2379-2380-2381-2382-2383-2384-2385-2386-2387-2388-2389-2390-2391-2392-2393-2394-2395-2396-2397-2398-2399-2400-2401-2402-2403-2404-2405-2406-2407-2408-2409-2410-2411-2412-2413-2414-2415-2416-2417-2418-2419-2420-2421-2422-2423-2424-2425-2426-2427-2428-2429-2430-2431-2432-2433-2434-2435-2436-2437-2438-2439-2440-2441-2442-2443-2444-2445-2446-2447-2448-2449-2450-2451-2452-2453-2454-2455-2456-2457-2458-2459-2460-2461-2462-2463-2464-2465-2466-2467-2468-2469-2470-2471-2472-2473-2474-2475-2476-2477-2478-2479-2480-2481-2482-2483-2484-2485-2486-2487-2488-2489-2490-2491-2492-2493-2494-2495-2496-24 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Form DWR-138
11/80FOR MONITORING
PURPOSES ONLYSTATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES2613748
COORD: 2513748

PERMIT NO. 26-6621-1

APPLICATION NO. _____

COUNTY UNION

WELL RECORD

1. OWNER POR: AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
Owner's Well No. 5 WWC SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 3-15-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 15.0 Feet
5. CASING: Type SEW. 40 PVC Diameter 2 inches Length 2.7 Feet
6. SCREEN: Type SEW. 40 PVC Size of Opening .020" Diameter 2 inches Length 12.3 Feet
- Range in Depth { Top 2.7 Feet
Bottom 15.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTWELL CORP TEST BRANCH Date 3-15-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of well casing arrangements, etc.)

850130958

DWR-138
11.**FOR MONITORING
PURPOSES ONLY.**STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES2613748
CODE: 2613717

PERMIT NO. 26-6639-4

APPLICATION NO. _____

COUNTY UNION

WELL RECORD

1. OWNER PORT AUTHORITY OF NJ & NY ADDRESS FIRST & RIVER ST.
Owner's Well No. MW-4501 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Loc: _____ Block: _____ Municipality: Elizabeth City
3. DATE COMPLETED 3-23-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. OG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY _____ Date _____

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

2 1984

PA 527
 11.00

BORING REPORT

26.13 748

26.60.1-4

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|--------------------------------------------------|--|---------------------------------------------|--|---------------------------------------|--|-------------------------------------------|--|
| NAME
KAPKOWSKI RD | | NAME OF CONTRACTOR
TESTNELL-CRAIG | | BORING NO.
NV 4501 | | SURFACE ELEV.
26.60.1-4 | |
| LOCATION
PORT ELIZABETH 545+00 T1 + 90 | | | | CONTRACT NO.
107.749 | | DATE
3-22-84 | |
| DIAMETER
3" 22.8" | | CASING SIZE
6" AUGER | | GROUND WATER LEVEL
3.22 - 4 | | | |
| NUMBER
190 | | NUMBER
300 | | Date
3-22-84 | | Time
7:30 | |
| BOILER
JOHN COYLE | | | | Depth
3.9' | | Remarks
INSIDE 4" P.A. DOWN 12' | |
| INSPECTOR
JOHN VARPONE B. ROSE | | | | | | | |

| CASING
BLOWS/FT. | DEPTH | SPOON
BLOWS/6" | RE-
COR'D | SAMP.
NO. | FILL | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
|---------------------|-------|-------------------|--------------|--------------|------|------------------------------------------------------------------|
| | | 1-9 | 16" | 1 | M-F | BROWN SAND TO SILT, LITTLE GRAVEL |
| N | | 16 | | | | |
| 0 | | 23-45 | 18" | 2 | | SAME AS ABOVE |
| 4 | | 35-65 | 16" | 3 | | SAME |
| 0 | | 193 | | | | |
| 5' | | 19 | | | | |
| | | 20-50 | 12" | 4 | | SAME |
| 5 | | 28-56 | 10" | 5 | | SAME |
| 7 | | 28 | | | | |
| | | 24-40 | 14" | 6 | | SAME |
| 1 | | 16-36 | 12" | 7 | | SAME WITH TR SHALE |
| | | 46 | | | | |
| | | 32-36 | 14" | 8 | | SAME |
| | | 32-46 | 8" | 9 | | M-F SILTY SAND TR CLAY SOME GRAVEL 12" |
| 1 | | 47 | | | | |
| | | 1-2 | 6" | 10 | | M-F SILTY SAND TR CLAY, SOME GRAVEL |
| 15' | | 1-3 | 8" | 11 | | SAME |
| | | 3 | | | | |
| | | 3-3 | 6" | 12 | | C-F SILTY SAND TR CLAY SOME GRAVEL 18" |
| | | 44-164 | 12" | 13 | | FILL M/F DARK BEN ONLY SAND, PAPER, NAILS, TR. VEX |
| | | 12 | | | | |
| 20' | | 20-22 | 14" | 14 | | FILL M/F BRN SILTY SAND, WOOD, PAPER, METAL, TR. VEX |
| | | 12-20 1/2" | 7" | 15 | | FILL SAME AS ABOVE |
| | | 32 | | | | |
| | | 10-80 | 2" | 16 | | FILL M/F BRN SILTY SAND, WOOD, BRICK, TR. VEX, METAL, TR. VEX |
| 25' | | 18-20 | 14" | 17 | | FILL SAME AS ABOVE |
| | | 12-23 | | | | |
| | | 10-10 | 8" | 18 | | FILL SAME AS ABOVE 27.0 |
| | | 14-8 | 12" | 19 | | DARK GRAY organic clay, silt mixed with peat |
| | | 6 | | | | |
| 30' | | | | | | Bottom of Boring |

850130960

Form DWR-138
11/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCESPERMIT NO. 26-65-1-8FOR MONITORING
PURPOSES ONLY

APPLICATION NO. _____

WELL RECORD

COUNTY Essex

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS 1111 6th Avenue
Owner's Well No. MW-6A SURFACE ELEVATION — Feet
(Above mean sea level)
2. LOCATION LOC: Block: Municipality: Elizabeth City
3. DATE COMPLETED 3-20-84 DRILLER Craig Test and Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 12.5 Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 7.5 Feet
6. SCREEN: Type SCH. 40 Size of Opening 0.20" Diameter 2 inches Length 5 Feet
- Range in Depth { Top 7.5' Feet
Bottom 12.5' Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? YES
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTER CRAIG TEST Boring Co. Date 3-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130961

24.13.74E

36-6646-8

BORING REPORT

| | | | |
|------------------------------------|--------------------------------------|-------------------------|-----------------|
| PROJECT
CONRAIL PIGGY BACK YARD | NAME OF CONTRACTOR
TESTWELL-CRAIG | ENGINE NO.
M-11# 6-A | SURFACE CLERK. |
| CALLER
POST ELIZABETH | | CONTRACT NO.
107.749 | DATE
7-20-94 |

| | | | | | | | |
|---------------------------|--|-------------------------|--|--------------------|------|-------|---------|
| SPRINT | | CASING SIZE
6" AUGER | | GROUND WATER LEVEL | | | |
| HOLE | | HANGER | | Date | Time | Depth | Remarks |
| S.P.M. | | S.P.M. | | 3-20 | 2:00 | 6.05' | |
| DRILLER
JOHN COYLE | | | | | | | |
| INSPECTOR
JOHN VARRONE | | | | | | | |

| CASING
BLOW/FT. | DEPTH | SPOON
BLOW/6" | RE-
COR'D | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------|--------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| | 0 | | | | INSTALLING TYPE 'A' MONITOR WELL |
| 6" | | | | | 5' SOUTH OF MONITOR WELL #6 |
| | | | | | WHICH IS NOT WORKING. |
| 1
2
3
4
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83
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85
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87
88
89
90
91
92
93
94
95
96
97
98
99
100 | 5 | | | NO SAMPLES TAKEN, REFER TO
BORING LOG FOR MW #6 FOR
SOIL CLASSIFICATIONS, P.W. FLOW
COUNTS. | |
| | 10 | | | | |
| | 15 | | | | 13.3 FT
BOTTOM OF B.S. |

NOTES: 1 - Length measured 6" - Line of Sample, T - Twp used
 2 - M = multibanded; A = access; OEN = open end road; V = vein

Form DWR-138
11/80STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORDINATE: 2013710

PERMIT NO. 26-6641-1

APPLICATION NO. _____

COUNTY _____

WELL RECORD

1. OWNER PORT AUTHORITY OF NY & NJ ADDRESS FIRST & RIVER ST.
 Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
 (Above mean sea level)
2. LOCATION LOT: _____ BLOCK: _____ Municipality: Elizabeth City
3. DATE COMPLETED 3-16-84 DRILLER Craig Testing Laboratory
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11 Feet
5. CASING: Type sch 40 PVC Diameter 2 inches Length 2.5 Feet
6. SCREEN: Type sch 40 PVC Size of Opening .020" Diameter 2 inches Length 8.6 Feet
- Range in Depth { Top 2.5 Feet
 Bottom 11.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
 Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
 Static water level before pumping _____ Feet below surface
 Pumping level _____ feet below surface after _____ hours pumping
 Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
 How pumped _____ How measured _____
 Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
 Type NONE Mfrs. Name _____
 Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
 Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
 Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
 Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
 Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG ATTACHED Are samples available? _____
 (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TESTWELL CRAIG TEST BRNG CO. Date 5-16-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
 analysis of the water, sketch map, sketch of special casing arrangements, etc.)

PA 547
11-66

BORING REPORT

20-6044-1

20-12-74

| | | | | | |
|-----------------------------------|-------------|-----------------------------------------------|-------|-----------------------------|----------------------------------------------|
| PROJECT
PORT ELIZ | | NAME OF CONTRACTOR
TEST-WELL CRAIG | | Boring No. 20-6044-1 | WAVEG. D.V. |
| LOCATION
KAPROWSKI ROAD | | CONTRACT NO. | | DATE | |
| SPRNG | CASING SIZE | GROUND WATER LEVEL | | | |
| 1" - 2" | 1" - 2" | Depth | Time | Depth | Remarks |
| 1" - 2" | 1" - 2" | 3-30 | 3:00 | 3.5' | TAKEN INSIDE N. FOR 60" |
| 1" - 2" | 1" - 2" | 3-45 | 3:40 | 2.7' | " |
| 1" - 2" | 1" - 2" | 3-55 | 11:00 | 4.5' | TAKEN AFTER AUGER WAS
TAKEN BACK TO 11.0' |
| DRILLER
JACK COLE | | INSPECTOR
BILL ROSE JOHN V. HANCOCK | | | |

| CASING
B. LVS. FT. | DEPTH | SPOON
BLOWS/6" | RE-
COV'D | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
|-----------------------|-------|-------------------|--------------|--------------|------------------------------------------------------------------|
| 6" | 0 | 2-3 | 14" | 1 | FILL |
| 11 | | 10 | | | |
| 11 | | 21-30 | 18" | 2 | FILL |
| 0 | | 18-34 | 18" | 3 | FILL SAME AS ABOVE |
| L | 5 | 3-10 | 12" | 4 | FILL |
| L | | 100-100 | N/R | | NOTED TR. OF SILT IN SECTION AT 11.5' |
| 0 | | 35 | | | NO REASONLY NOTHING WOOD NO PENETRATION |
| W | 10 | 30-35 | 8" | 5 | FILL |
| | | 21-21 | 10" | 6 | FILL |
| | | 19 | | | |
| J | | 6-5 | 10" | 7 | ON DIST. 5' TO 5' 10" AND SOME GARN. TO 11.1' 12.0' |
| Ti | | 1-4 | 15" | 8 | DIST. 10' TO 10' 10" TO 11.5' |
| F | 15 | | | | |
| 21 | | | | | |
| A | | | | | |
| U | 20 | | | | |
| G | | | | | |
| E | | | | | |
| R | | | | | |

NOTES: 1 - Length recovered; 0 - Loss of Sample; T - Tray used
 2 - U = undisturbed; A = auger; OER = open end rod; V = void

Form DWR 138
11/80**FOR MONITORING
PURPOSES ONLY**STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO. _____

APPLICATION NO. _____

COUNTY _____

WELL RECORD

1. OWNER PURE AUTHORITY OF NJ & NJ ADDRESS PIERCE & FENNER ST.
Owner's Well No. MW - 3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipal: _____
3. DATE COMPLETED 3-15-84 DRILLER CRIG TEST BORING CO.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 24.0 Feet
5. CASING: Type SCH. 40 PVC Diameter 2 inches Length 9.5 Feet
6. SCREEN: Type SCH. 40 PVC Size of Opening .020" Diameter 2 inches Length 14.5 Feet
- Range in Depth { Top 9.5 Feet
Bottom 24.0 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date None Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR GROUNDWATER MONITORING AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG ATTACHED Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER'S LOG
14. DATA OBTAINED BY TERRELL CRAIG TEST BORING CO. Date 3-15-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

2 B&C

850130965

PA 807
11.00

BORING REPORT

PROJECT
KAPROWSKI RD
LOCATION
PORT ELIZABETHNAME OF CONTRACTOR
TESTWELL CRAIGBORING NO. **9833**
H.W. 3 W.K.
CONTRACT NO.DATE
SURFACE ELEV.SPOON
CASSING SIZE
NAME
NUMBER
DRILLED
INSPECTOR**JOHN COYLE****BRASE J. VARRONE**

| Date | Time | Depth | Remarks |
|---------|------|-------|--------------------------------------|
| 3-14-56 | 11:5 | 12.2 | THREE 7.0" H.W. 3 W.K. CO. HOLE 15.5 |
| 3-15-56 | | 1 | |

| CASSING
BLOWS/FT. | DEPTH | SPOON
BLOWS/6" | RE-
COY'D | SAMP.
NO. | SAMPLE DESCRIPTION AND REMARKS
LINE LOCATES CHANGE OF PROFILE |
|----------------------|-------|-------------------|--------------|--------------|------------------------------------------------------------------|
| | 0 | 2-7 | 15" | 1 | 7.1' H.W. 3 W.K. 15.5 |
| | | 41-50 | 15" | 2 | 7.1' H.W. 3 W.K. 15.5 |
| | | 21-44 | 14" | 3 | 7.1' H.W. 3 W.K. 15.5 |
| | | 58 | | 4 | 7.1' H.W. 3 W.K. 15.5 |
| | 5 | 54-92 | 16" | 5 | 7.1' H.W. 3 W.K. 15.5 |
| | | 37-92 | 15" | 6 | 7.1' H.W. 3 W.K. 15.5 |
| | | 41-92 | 18" | 7 | 7.1' H.W. 3 W.K. 15.5 |
| | 10 | 45-46 | 16" | 8 | 7.1' H.W. 3 W.K. 15.5 |
| | | 16-20 | 11" | 9 | 7.1' H.W. 3 W.K. 15.5 |
| | | 6-50 | 6" | 10 | 7.1' H.W. 3 W.K. 15.5 |
| | 15 | 82-12 | 8" | 11 | 7.1' H.W. 3 W.K. 15.5 |
| | | 29-12 | 8" | 12 | 7.1' H.W. 3 W.K. 15.5 |
| | | 10 | | 13 | 7.1' H.W. 3 W.K. 15.5 |
| | | 10-30 | 10" | 14 | 7.1' H.W. 3 W.K. 15.5 |
| | | 6-6 | 8" | 15 | 7.1' H.W. 3 W.K. 15.5 |
| | 20 | 16-20 | 8" | 16 | 7.1' H.W. 3 W.K. 15.5 |
| | | 12-15 | 8" | 17 | 7.1' H.W. 3 W.K. 15.5 |
| | | 9-8 | 6" | | 7.1' H.W. 3 W.K. 15.5 |
| | 25 | 3-5 | 18" | | 7.1' H.W. 3 W.K. 15.5 |

NOTES: 1 - Length recovered; 0" - Loss of Sample, T - Trap used
 2 - U - Under the bed; A - upper, OCB - open and red, V - very

850130966

Form DW-137
11/75STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES26-10622
PERMIT NO. ~~26-10622~~
APPLICATION NO. 26-10622

WELL RECORD

COUNTY _____

1. OWNER International Mat ADDRESS 196 Glenfield St
NEWARK N.J.
Owner's Well No. MU-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION SAME
3. DATE COMPLETED 5/6/87 DRILLER Summit Drilling
4. DIAMETER: Top 8" inches Bottom 8" inches TOTAL DEPTH 12'-0" Feet
5. CASING: Type PVC Diameter 4" inches Length 1'-0" Feet
6. SCREEN: Type PVC Size of Opening 20/40 Diameter 4" inches Length 10'-0" Feet
- Range in Depth { Top _____ Feet
Bottom 12' Feet
- Geologic Formation FILL
- Tail Piece Diameter N.A. inches Length _____ Feet
7. WELL FLOWS NATURALLY N.A. Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date N.A. Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT
Type N.A. Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitor AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Draw sketch on back of sheet or on separate sheet. If drawing log use metric. Please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Summit Drilling Date 5/6/87

(NOTE: Use other side of this sheet for additional information such as log of material penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

20 18 17 26-10623
PERMIT NO. 26-10623
APPLICATION NO. _____
COUNTY _____

WELL RECORD

1. OWNER International Meteorological ADDRESS 46 Blawie St. Newark
Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION SAME
3. DATE COMPLETED 5/6/82 DRILLER Summit Drilling Co. Inc.
4. DIAMETER: Top 8" inches Bottom 8" inches TOTAL DEPTH 12' Feet
5. CASING: Type P.V.C. Diameter 4" inches Length 1'-0" Feet
6. SCREEN: Type P.V.C. Size of Opening 200 Diameter 4" inches Length 10'-0" Feet
- Range in Depth: { Top _____ Feet
Bottom 12' Feet
- Geologic Formation FI
- Test Piece Diameter N.A. inches Length _____ Feet
7. WELL FLOWS NATURALLY N.A. Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date N.A. Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT N.A.
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitor AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ (See details on back of sheet or on separate sheet. If electric log was made, please furnish copy.) Are samples available? _____
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Summit Drilling Date 5/6/82

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130967

Coordinate #:

26.137.77

WELL RECORD

2611527

APPLICATION NO.

Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey

Owner's Well No. SB-1 Lot: 16 Block: 5001 SURFACE ELEVATION

2. LOCATION DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 20.0'

5. CASING: TYPE PRC Diameter 2 inches Length 15.0'

6. SCREEN: TYPE PRC Size of Opening 0.10 Diameter 2 inches Length 5.0'

Range in Depth { Top Feet Bottom Feet Geologic Formation

Tubing: Diameter inches Length Feet

7. WELL FLOWS NATURALLY Gallons per minute at Feet above surface

Water rises to Feet above surface

8. RECORD OF TESTS: Date NONE Yield Gallons per minute

Static water level before pumping Feet below surface

Pumping level Feet below surface after hours pumping

Drawdown Feet Specific Capacity Gals. per min. per ft. of drawdown

How pumped How measured

Observed effect on nearby wells

9. PERMANENT PUMPING EQUIPMENT: Type NONE Mfg. Name

Capacity G.P.M. How Driven H.P. R.P.M.

Depth of Pump in well Feet Depth of Footvalve in well Feet

Depth of Air Line in well Feet Type of Meter on Pump Size inches

10. USED FOR Monitoring Purposes AMOUNT { Average Gallons Daily

Maximum Gallons Daily

11. QUALITY OF WATER TASTE Color Temp. °F

12. LOG

13. SOURCE OF DATA Walter Katten # 1316 Date October 9, 1987

14. DATA OBTAINED BY

NOTE: THE STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND AEROSPACE

850130968

Essex

WELL RECORDED

Lot: 16 Block: 5001

DATE COMPLETED 9109187 DRAFTER EMPIRE SOILS INVESTIGATIONS, INC.

DATE COMPLETED _____
DIAMETER: TOP 4 inches SECTION 4 inches TOTAL DEPTH 17.0'

4. DIAMETER: 4 INCH
MATERIAL: STAINLESS STEEL
Diameter 4 INCH Length 7.0'

CASING: TYPE DRILL PIPE Size 4 1/2" Weight 17.5 lbs/ft
SCREEN: TYPE " " Size of Opening 0.15 Diameter 4 Inches Length 10.0 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet

Geologic Formation _____

Total Feet: Diameter _____ Inches Length _____ Feet

7. WELL BEINGS NATURALLY _____ Caloric requirement is _____ Intake is _____ /

Water level to _____ Feet above surface

1. RECORD OF TEST: Dye NONE Yield Gallons per minute

Spring water level before dumping: _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Strawdown _____ Feet Specific Gravity _____ Gals. per min. per cu. ft. of strawdown

How pumped _____ How measured _____

Carved into on nearby walls _____

1. PERMANENT PUMPING EQUIPMENT:

Inst. NONE Offl. Name

Crossing _____ G.P.M. How Often _____ H.P. _____ T.P.M. _____

Depth of Pump in well _____ Feet Depth of Fasteners in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ SAMPLE: 11 _____ No _____

Time _____ Score _____ Date: _____ Time: _____

12. 103 _____ (יחידת חיסול אר) _____
 (השם המלא של כל אחד מהמשתתפים בפרויקט יצא מזה הסוד והועבר למשרד הביטחון)

4. Source of data _____

Walter Rott # 1316

[illegible]

850130969

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL NO: 2611522-1

Coordinate #: 2F.13.7.78

APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER City of Newark ADDRESS Newark, New Jersey
Owner's Well No. MW-3A SURFACE ELEVATION _____ Feet
2. LOCATION Lot: 16 Block: 5001 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
3. DATE COMPLETED 9/04/87 TOTAL DEPTH 15.0' Feet
4. DIAMETER: TOP 4 inches Section 4 inches Length 5.0' Feet
5. CASING: TYPE STAINLESS STEEL Diameter 4 inches Length 10.0' Feet
6. SCREEN: TYPE _____ Size of Opening 0.15 Diameter 4 inches

Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
Feet above surface _____

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
Yield _____ Gallons per minute

8. RECORD OF TEST: Date NONE Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT: Type NONE Mfg. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample _____ No. _____
Taste _____ Color _____ Temp. _____ °F.
Any unusual constituents? _____

12. LOG _____
(See Form on back of cover of this manual for instructions on how to fill in this log.)

13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris O'Shaughnessy #419 October 9, 1987

NOTES: 1. The owner of this well is responsible for the proper use of the well and for the protection of the well from contamination.
2. The user of this well should follow the instructions on the back of the cover of this manual.

850130970

Coordinate - : 26.13.7.70

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL NO: 2611523-9

APPLICATION NO: _____
COUNTY: Essex

WELL RECORD

1. OWNER: City of Newark ADDRESS: Newark, New Jersey
2. WELL NO: MW-2A SURFACE ELEVATION: _____ Feet
3. LOCATION: Lot: 16 Block: 5001 DRILLER: EMPIRE SOILS INVESTIGATIONS, INC.
4. DATE COMPLETED: 9/08/87 TOTAL DEPTH: 15.0' Feet
5. DIAMETER: TOP 4 inches BOTTOM 4 inches LENGTH: 5.0' Feet
6. CASING: TYPE: Stainless Steel DIAMETER: 4 inches LENGTH: 10.0' Feet
7. SCREEN: TYPE: _____ SIZE OF OPENING: 0.15 DIAMETER: 4 inches LENGTH: _____ Feet

8. RANGE IN DEPTH: { TOP: _____ Feet GEOLGIC FORMATION: _____
BOTTOM: _____ Feet
9. TAIL PIPES: DIAMETER: _____ inches LENGTH: _____ Feet

10. WELL FLOWS NATURALLY: _____ Gallons per minute at _____ Feet above surface
11. RECORD OF TEST: DATE: NONE YIELD: _____ Gallons per minute
12. STATIC WATER LEVEL BEFORE PUMPING: _____ Feet below surface
13. PUMPING LEVEL: _____ Feet below surface AFTER _____ hours pumping
14. DRAWDOWN: _____ Feet SPECIFIC CAPACITY: _____ Gals. per min. per ft. of drawdown
15. HOW PUMPED: _____ How measured: _____
16. OBSERVED EFFECT ON NEARBY WELLS: _____

17. PERMANENT PUMPING EQUIPMENT: NONE
18. TYPE: _____ MFG. NAME: _____
19. CAPACITY: _____ G.P.M. HOW DRIVEN: _____ H.P. _____ R.P.M. _____
20. DEPTH OF PUMP IN WELL: _____ Feet DEPTH OF FOOTVALVE IN WELL: _____ Feet
21. DEPTH OF AIR LINE IN WELL: _____ Feet TYPE OF METER ON PUMP: _____ SIZE: _____ inches

22. USED FOR: Monitoring Purposes AMOUNT: { Average: _____ Gallons Daily
Maximum: _____ Gallons Daily

23. QUALITY OF WATER: _____ SAMPLED: _____ YES _____ NO _____
TASTE: _____ COLOR: _____ TEMPERATURE: _____

24. LOG: _____ ANY REMARKS AVAILABLE: _____
(SEE REVERSE OF WELL RECORD FOR DETAILS OF LOGGING AND PUMP, SCREEN, TAILPIPE, ETC.)

25. SOURCE OF DATA: _____ DATE: October 9, 1987
26. DATA OBTAINED BY: Walter Kotten #1316

NOTE: THE STATE OF NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER RESOURCES, IS NOT RESPONSIBLE FOR THE ACCURACY OF THE DATA OBTAINED BY THE USER OF THIS FORM.

850130971

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269072

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/7/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 20 Feet
5. CASING: Type PVC Diameter 4 inches Length 5 Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 15 Feet
- Range in Depth { Top 15 Feet
Bottom 20 Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If sampling was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130972

79W-1

0' - 1' Brown Loose Silt and Cinder, Wood, Glass-FILL
1' - 9' Black Silt w/Trace Clay, Misc.-FILL
9' - 10' Yellow Brown Misc.-FILL
10' - 20' Brown Silty Clay

MAY 14 1988
DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850130973

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269073

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/6/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 17'6" Feet
5. CASING: Type PVC Diameter 4 inches Length 2'6" Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 15 Feet
Range in Depth { Top 2'6" Feet
Bottom 17'6" Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color 1-121 Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130974

PM-2

0' - 5' Brown Silt w/Fine Sand, Clay at Bottom
5' - 14' Dark Brown Black, Very Dense Silty Clay
14' - 17'6" Brown Sand w/Some Gravel

Mar 14 '88

DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850130975

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269074

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/6/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom: 4 inches TOTAL DEPTH 11' Feet
5. CASING: Type PVC Diameter 4 inches Length 1' Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 10' Feet
Range in Depth { Top 1 Feet
Bottom 11 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ 80 Fitter Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Note details on back of sheet or on separate sheet. If chemical log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130976

PM-3

| | | | |
|----|---|-----|------------------------------------------------------------------------|
| 0' | - | 3' | Brown Sandy Silt w/Fine to Medium Gravel |
| 3' | - | 6' | Black Cinders w/Fine to Medium Gravel |
| 6' | - | 8' | Brown Organic Peat |
| 8' | - | 11' | Black Cinder and Fine to Medium Gravel w/
little Peat and Fine Sand |

Nov 14 '98

DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850130977

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23.112

PERMIT NO 2610407
APPLICATION NO _____
COUNTY Essex

WELL RECORD

1. OWNER Stanley Tool ADDRESS Newark, New Jersey
OWNER'S Well No. MW-12 SURFACE ELEVATION _____ Feet
(Above Mean Sea Level)

2. LOCATION Lot: 20,21,22&23 Block: 2445

3. DATE COMPLETED March 27, 1987 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER Top 4 inches Bottom 4 inches TOTAL DEPTH 16.0' Feet

5. CASING: Type PVC Diameter 4 inches Length 6.0' Feet

6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10.0' Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____

Well Pipe: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT.
Type _____ Mfr. Name _____
Capacity _____ G.P.M. Motor Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }

11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Color _____ Odor _____ Turb. _____

12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If samples log was made, attach sample only.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Chris O'Shaughnessy & Supervisor: Jerry Date April 13, 1987
Ralack #1167

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130978

Form DWR-1
11/80

(GAS)
**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 2311.3
PERMIT NO. 26-5297

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Essex Chemical Corporation ADDRESS 1401 Broad St. Clifton, New Jersey
Owner's Well No. T-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Doremus Ave.
3. DATE COMPLETED 10-5-81 DRILLER: H. P. Drilling, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 25 Feet
5. CASING: Type PVC Diameter 2 inches Length 22 Feet
6. SCREEN: Type Cont. slot Size of Opening .020 Diameter 2 inches Length 20 Feet
- Range in Depth { Top 5 Feet
Bottom 25 Feet
- Geologic Formation net
- Tail Piece: Diameter 2 1/2 inches Length 22 Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date No test taken Yield _____ Gallons per minute
Static water level before pumping 4 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Gas Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Yes- Attached Are samples available? No
(Give details on back of sheet or on separate sheet. If chemical log was made, please furnish copy.)
13. SOURCE OF DATA H. P. Drilling, Inc.
14. DATA OBTAINED BY H. P. Drilling, Inc. Date 10-5-81

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130979

850130980

Ep Drilling, Inc.

804 Princeton Avenue • National Park, N.J. 08083
609-845-8780

26.23.113

26-529

TEST BORINGS - WATER WELLS - PERCOLATION TESTS - MONITORING WELLS

Client Thor Engineers

Date 10/5/81

Project Essex Chemical

Job No. 446

Boring No. TW- 1

Sheet No. 1

of 1

Ground Surface Elev. 33.2

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | DEPTH | |
|-------------------|-------------|---------|----------------------------|---------------|-----------------------------------|-------|
| DEPTH | HOUR | DATE | A | Rotary Method | TO 25' | |
| 4' | | 10/5/81 | | | TO | |
| | | | | | TO | |
| DEPTH | CASING BLOW | NO. | SAMPLE DEPTH | N | SOIL CLASSIFICATION | DEPTH |
| 5' | | | 0-5 | | Miscellaneous Fill | 5' |
| 10' | | | | | Very Soft Black Moist Silt & Peat | |
| 15' | | | | | | |
| 20' | | | | | | |
| 25' | | | 5-25' | | | |
| 30' | | | | | Test Boring Completed at 25' | |
| 35' | | | | | | |
| 40' | | | | | | |

UD - 3" O.D. Soil Bore Sample
U - Undisturbed Sample, 3" Diameter
C - Core Drilling

N - Standard Penetration Resistance per SPT
(140# hammer, 30" drop)

N.R. - No Recovery

Driller Michael Pratt

Helper Gerald Freck

Form DWB-128
11/80

(Gas)
**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL RECORD

26-23-113
PERMIT NO. 16-0-02
APPLICATION NO. _____
COUNTY ESSEX

1. OWNER Monex Chemical Corporation ADDRESS 1401 Broad St. Clifton, New Jer:
Owner's Well No. T"-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Doremus Ave.
3. DATE COMPLETED 10-2-81 DRILLER H. P. Drilling, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 25 Feet
5. CASING: Type PVC Diameter 2 inches Length 7 Feet
6. SCREEN: Type Cont. slot Size of Opening .020 Diameter 2 inches Length 20 Feet
- Range in Depth { Top 5 Feet
Bottom 25 Feet
- Geologic Formation _____
- Tail Piece: Diameter 2x2 inches Length 2x2 Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date No test taken Yield _____ Gallons per minute
Static water level before pumping 12 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Gas Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Yes-Attached Are samples available? No
(Give details on back of sheet or on separate sheet. If abstract log was made, please furnish copy.)
13. SOURCE OF DATA H. P. Drilling, Inc.
14. DATA OBTAINED BY H. P. Drilling, Inc. Date 10-2-81

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130981

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623113

26-7254

PURPOSES ONLY

PERMIT NO. _____

APPLICATION NO. 2-56X

COUNTY _____

WELL RECORD

GETTY REFINING AND MARKETING

86 DOREMUS AVE.

1. OWNER _____ ADDRESS _____

Owner's Well No. _____ SURFACE ELEVATION _____ Feet
Lot: _____ Block: _____ Municipality: Newark (Above mean sea level)

2. LOCATION _____ Warren George Inc.

3. DATE COMPLETED _____ DRILLER _____

4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet

5. CASING: Type _____ Diameter _____ inches Length _____ Feet

6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfrs. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA Boiling Log

14. DATA OBTAINED BY Warren George, Inc Date 1/5/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130982

Form DW-138
11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623113

PERMIT NO. 6-7255

APPLICATION: _____

COUNTY: ESSEX

WELL RECORD

1. OWNER GETTY REFINING AND MARKETING ADDRESS 86 DOREMUS A
- Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(sea mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED _____ DRILLER Warren George Inc.
4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA 3-11-86 log
14. DATA OBTAINED BY Warren George, Inc. Date 1/5/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130983

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO. 2609705

OR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY

Owner's Well No. MW-2 SURFACE ELEVATION _____ (Above mean sea level)

2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445

3. DATE COMPLETED 10/20/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 19.0 Feet

5. CASING: Type PVC Diameter 4 inches Length 7.0 Feet

6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

8. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfr. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

9. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

10. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

LOG _____ Are samples available? _____
(Also attach on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)

SOURCE OF DATA _____

4. DATA OBTAINED BY J. J. JAWORSKI #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130984

Form DW-1 128
17/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO.

2609674-9

APPLICATION NO.

COUNTY ESSEX

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, N. J. ESSEX
Owner's Well No. MW-10 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445
2. LOCATION _____
3. DATE COMPLETED 10/10/86 DRILLER EMPIRE SOILS INVESTIGATION, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 0 Feet
5. CASING: Type PVC Diameter 4 inches Length 10.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Color _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Also attach on back of sheet or on separate sheet. If already log was made, attach former copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey J. JUDANSKI #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials processed, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130985

11/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO 260975-7

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-1 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445
2. LOCATION _____
3. DATE COMPLETED 10/14/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 62.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 5 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 0 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Turb. _____ cf.
12. LOG _____ (Also details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130986

11/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO.

2609616-5

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO.

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
 2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445
 3. DATE COMPLETED 10/8/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
 4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 110.0 Feet
 5. CASING: Type PVC Diameter 4 inches Length 2.0 Feet
 6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
 8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
 9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
 10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
 11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
 12. LOG _____ Are samples available? _____
(Make entries on back of sheet or on separate sheet. If sample log was made, please furnish copy.)
 13. SOURCE OF DATA _____
 14. DATA OBTAINED BY Jeffrey Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130987

26.23.113

2609677-3

APPLICATION NO. _____

COUNTY ESSEX

WELL RECORD

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-4 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/19/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 53.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 45.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footcandle in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Stanley Tools #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130988

11/85

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

2623-113

PERMIT NO. 2607678-1

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-8 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/16/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 46.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 36.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tell Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footcandle in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Note: Attach on back of sheet or on separate sheet. If answers are yes/no, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey Sawinski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials processed, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130989

11/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

PERMIT NO

26.23.113
260974-0

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET NEWARK, NEW JERSEY
Owner's Well No. MW-11 SURFACE ELEVATION _____ Feet
(Above mean sea level)
 2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445
 3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
 4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 14.0 Feet
 5. CASING: Type PVC Diameter 4 inches Length 8.0 Feet
 6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 6.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
 8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
 9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
 10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
 11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
 12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
 13. SOURCE OF DATA _____
 14. DATA OBTAINED BY RICHARD E. M. D. S. #1312 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, geologic map, sketch of special casing arrangements, etc.)

850130990

11/8:

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23 113 2607680-3

PERMIT NO

APPLICATION NO

COUNTY ESSEX

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-5 SURFACE ELEVATION _____ Feet:
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 46.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 36.0 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Minimum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Also attach on back of sheet or on separate sheet. If samples log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130991

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-9 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/16/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 19.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 9.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Minimum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If answers lay too small, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Orville J. Jankowski #1315 Date 10/31/86

NOTE: Use other side of this sheet for additional information such as log of materials generated, analysis of the water, sketch map, sketch of ground water conditions, etc.)

850130992

11/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO. 2609703

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-6 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 16.0 Feet
6. SCREEN: Type PVC Size of Opening 010 Diameter 4 inches Length 10.0 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footcandle in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Minimum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Also attach on back of sheet or on separate sheet. If records log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey J. Jundak #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130993

11/86

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

2623-113 PERMIT NO 26097

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-7 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Show mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 11.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 6.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 5.0 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Also attach on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RANDOLPHSON #1312 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130994

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES26-23-113 2609850
PERMIT NO. 2609850FOR MONITORING
PURPOSES ONLYWELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER NL SPENCER KELLOGG, INC. ADDRESS 1230 AVENUE OF THE AMERICAS
NEW YORK, NEW YORK 10020
Owner's Well No. MW-23 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 9&11 BLOCK: 5070
3. DATE COMPLETED 11/25/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 38.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 28.0 Feet
6. SCREEN Type PVC Size of Opening .010 Diameter 4 inches Length 10.0 Feet
DOUBLE CASED - 8" CASING TO 10.5'
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY JEFFREY JAWORSKI #1315 Date 12/10/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130995

Form DWR-138
11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7445

APPLICATION NO. _____

Essex

COUNTY _____

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
- Owner's Well No. P-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/21/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 1050T Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfr. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If sample log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Braun Date 2/21/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130996

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7446

APPLICATION NO. _____

Essex

COUNTY _____

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
Owner's Well No. P-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet U
6. SCREEN: Type PVC Size of Opening 20 SLOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Baur Date 2/22/85

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7447

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
- Owner's Well No. P-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/26/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet ^{SU}
6. SCREEN: Type PVC Size of Opening 20 SLT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/26/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850130998

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶
PERMIT NO. 26-7448
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
Owner's Well No. P-4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20/50 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR: _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Show details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/22/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

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11/80

WR-128

FOR MONITORING
PERMIT NO. 26-7449

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7449

APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
Owner's Well No. P-5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/25/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet ⁵⁰
6. SCREEN: Type PVC Size of Opening 2x10 Diameter 2 inches Length 10.0 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rise to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/25/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131000

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7450

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
Owner's Well No. P-16 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/25/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 205/10 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tell Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Show details on back of sheet or on separate sheet. If alternate log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/25/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131001

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623
PERMIT NO. 26-7451

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15B TURNPIKE
Owner's Well No. P-7 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Espero Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SLOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/22/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131002

**FOR MONITORING
PURPOSES ONLY**

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-8 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/12/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10+27 STICKS
5. CASING: Type PVC Diameter 2 inches Length 27 Feet
6. SCREEN: Type PVC Size of Opening 10SLOT Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/12/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

Form OWR-138
1-78

FOR MONITORING
PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623¹¹⁶
PERMIT NO. 26-7915
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-9 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/13/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 + 2 Feet
5. CASING: Type PUC Diameter 2 inches Length 27 Feet
6. SCREEN: Type PUC Size of Opening 10 SLOT Diameter 2 inches Length 10 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Draw _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfr. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USE FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Empire Soils Investigations Date 8/13/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131004

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623¹¹⁶
PERMIT NO. 26-7916
APPLICATION NO. _____
COUNTY Essex

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-10 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/13/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 Feet
5. CASING: Type PUC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PUC Size of Opening 10 SLOT Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/13/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131005

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7917

APPLICATION NO. _____

COUNTY Essex

OR MONITORING
PURPOSES

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15B-TURNPIKE
Owner's Well No. P-11D SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/20/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 38.5 Feet
5. CASING: Type PVC Diameter 4 inches Length 28.5 Feet
6. SCREEN: Type PVC Size of Opening 10 SLOT Diameter 4 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/20/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131006

**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶ ~~272~~
PERMIT NO. 26-7918
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-11-S SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/14/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH _____ Feet
5. CASING: Type PVC Diameter 2 inches Length _____ Feet
6. SCREEN: Type PVC Size of Opening 10 SLOT Diameter 2 inches Length 10 Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR: _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Note details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/14/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131007

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORD: 26.23.1.25
PERMIT NO. 2611916-1
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER NL Spencer Kellog, Inc. ADDRESS New York, New York 07105
Owner's Well No. MW-16 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 9 & 11 Block: 5070
3. DATE COMPLETED 4/11/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top _____ inches Bottom 4 inches TOTAL DEPTH 5.5' Feet
5. CASING: Type PVC Diameter 4 inches Length 2.5' Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 4 inches Length 3.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes Only AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Show details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jon Yeaton #1415 Date December 7, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131008

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORD: 26.23.1.25
PERMIT NO. 261417-0
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER NL Spencer Kellog, Inc. ADDRESS New York, New York 07105
Owner's Well No. MW-19 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 9 & 11 Block: 5070
3. DATE COMPLETED 11/12/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 5.0' Feet
5. CASING: Type PVC Diameter 4 inches Length 2.5' Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 4 inches Length 2.5' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes Only AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jon Yeaton #1415 Date December 7, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131009

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6742

APPLICATION NO. _____

COUNTY Hudson

**FOR OBSERVATION
PURPOSES ONLY**

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 1 SURFACE ELEVATION (Above mean sea level) Feet

2. LOCATION Lot 1 Block 1 Municipality Kearny Town

3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co. Inc.

4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH 11 Feet

5. CASING: Type _____ Diameter 2 inches Length 1 Feet

6. SCREEN: Type PV Size of Opening 30 Diameter 2 inches Length 10 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet

Geologic Formation SAND SILT

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping 1.96 Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfr. Name _____ H.P. _____ R.P.M. _____

Capacity _____ G.P.M. How Driven _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER ? Sample: Yes _____ No _____

Taste 7 Odor YES Color CLEAR Temp. _____ °F.

12. LOG _____ Are samples available? _____

13. SOURCE OF DATA PALEO. O

14. DATA OBTAINED BY LOUIS ANTER Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131010

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6703

APPLICATION NO. _____

COUNTY Hudson

FOR OBSERVATION
PURPOSES ONLY

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot Block _____ Municipality Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co. Inc.
4. DIAMETER: Top 2 inches Bottom _____ inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation SILT CLAY
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.50 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes _____ No _____
Taste ? Odor YES Color CLEAR Temp. 1 °F.
12. LOG _____ Are samples available? YES
(Give details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONICK Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials processed, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131011

Form DW-128
11/80

**WATER OBSERVATION
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6704

APPLICATION NO. _____

COUNTY Hudson

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot _____ Block _____ Municipality: Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation SILT CLAY, SAND.
- Tell Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.75 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Observation AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes _____ No _____
Taste ? Color yes Color clear Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If details log was made, please furnish copy.)
13. SOURCE OF DATA Official
14. DATA OBTAINED BY LOUIS C. NICH Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131012

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6745

APPLICATION NO. _____

COUNTY Hudson

FOR ~~USE~~
PURPOSES ONLY

WELL RECORD

1. OWNER S & S WASTE, INC. ADDRESS 115 JACOBUS RD.
Owner's Well No. SW 4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co., Inc.
4. DIAMETER: Top 2 inches Bottom _____ inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation SAND SH CLAY
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.95 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes ☒ No ☒
Taste ? Odor Y:? Color CLEAR Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If chemical log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONICK Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131013

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.123

PERMIT NO. 26-7392

APPLICATION NO. _____

COUNTY _____

FOR OBSERVATION
PURPOSES ONLY

WELL RECORD

1. OWNER S.W. WASTE INC ADDRESS 115 JARVIS AVE S. KENNY, N.J.
Owner's Well No. 5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 115 JARVIS AVE SOUTH KENNY N.J. 07032
3. DATE COMPLETED 12-14-84 DRILLER LOUIS ONTECH DIAMOND DRILLING CORP
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation SAND & SILTY CLAY
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.84' Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes _____ No _____
Taste ? Odor YES Color CLAYY Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONTECH Date 12-14-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131014

850131015

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Permit No. 26-4687
Application No. _____
County _____

WELL RECORD

1. OWNER SYNCON CORP. ADDRESS 77 JACOBUS ST.
Owner's Well No. 1 SURFACE ELEVATION KEARNY, N.J. 07032 Feet
(Above mean sea level)
2. LOCATION 500' WEST OF JACOBUS ST. 1/2 MILE NORTH OF PULASKI Skyway
3. DATE COMPLETED 8-26-76 DRILLER PAUL ZERGE
4. DIAMETER: top 10 inches Bottom 8 inches TOTAL DEPTH 403 Feet
5. CASING: Type WELDED STEEL Diameter 8 inches Length 60 Feet
6. SCREEN: Type NONE Size of Opening - Diameter - inches Length - Feet
Range in Depth { Top - Feet TEST WELL ONLY - ALL MAT'L PULLED OUT.
Bottom - Feet Geologic Formation
7. Well flows naturally - Gallons per Minute at - Feet above surface
Water rises to - Feet above surface
8. RECORD OF TEST: Date 9-1-76 Yield 30 Gallons per minute
Static water level before pumping 12'6" Feet below surface
Pumping level 89' feet below surface after 4 hours pumping
Drawdown 76.5 Feet Specific Capacity .39 Gals. per min. per ft. of drawdown
How Pumped SUBMERSIBLE How measured 5 GAL. CAN
Observed effect on nearby wells NONE
9. PERMANENT PUMPING EQUIPMENT: NONE - WELL ABANDONED
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily,
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____
12. LOG SEE ENCLOSED Are samples available? NO
(Give details on back of sheet or on separate sheet. If otherwise log was made, please furnish copy)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY [Signature] Date 3-29-79

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

LOG OF WELL

26 13 755

56-4687

- 0'-20'- GREY SILTY SAND
- 20'-27'- SILTY FINE TO COARSE SAND, FINE GRAVEL
- 27'-43'- GREY SOFT SILTY CLAY
- 43'-54'- BROWN SOFT SILTY CLAY
- 54'-57'- BROWN SHALY CLAY
- 57'-160'- RED SHALE
- 160'-168'- RED SHALE BROKEN - LITTLE WATER
- 168'-175'- RED SHALE HARD
- 175'-177'- RED SHALE BROKEN
- 177'-276'- RED SHALE
- 276'-298'- RED SHALE HARD
- 298'-308'- RED SHALE STREAKS, GREY LIME STONE
- 308'-310'- RED SHALE BROKEN
- 310'-340'- RED SHALE HARD
- 340'-352'- HARD RED SHALE, STREAKS GREY ROCK
- 352'-367'- VERY HARD GREY TO BLUE ROCK HARD.
- 367'-403'- HARD RED ROCK

Form 87

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

T 26.13 753

Permit No. 26-4099
Application No. _____
County Hudson

WELL RECORD

1. OWNER Schiavone Const. Co. ADDRESS Belleville Pike
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Belleville Pike Kearny N.J.
3. DATE COMPLETED May 19 DRILLER Alger Bros
4. DIAMETER: top 6 inches Bottom 6 inches TOTAL DEPTH 215 Feet
5. CASING: Type PIK Threaded Diameter 6 inches Length 105 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date May 19 Yield 6 Gallons per minute
Static water level before pumping 23 Feet below surface
Pumping level 180 feet below surface after 4 hours pumping
Drawdown 157 Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How Pumped Submersible How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type Submersible Mfrs. Name Fairbanks & Morse
Capacity 6 G.P.W. How Driven ELECT H.P. 1/2 S.P.W. 3412'
Depth of Pump in well 189 Feet Depth of Footplate in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Toilet & washing only AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER Brackish Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Ernest Alger Date 08-30-67

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

0 - 25 FT. sandy Fill
25 - 40 " Meadow mat + sand
46 - 90 " Clay
90 - 100 " Sand.
100 - 105 " Red hard Pan
105 - 215 " red sand stone

850131019

Form 67

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

26-13-77547
H
Permit No. 26-3293
Application No. _____
County _____

WELL RECORD

1. OWNER Fairmount Chemical Co., Inc. ADDRESS 117 Blanchard St., Newark, N.J.
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 117 Blanchard St., Newark, Essex County
3. DATE COMPLETED Industrial DRILLER Somerville Well Drilling Co.
4. DIAMETER: top 8 inches Bottom 8 inches TOTAL DEPTH 300 Feet
5. CASING: Type LDrive Diameter 8 inches Length 114 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 8/5/65 Yield 300 Gallons per minute
Static water level before pumping 50 Feet below surface
Pumping level 200 feet below surface after 8 hours pumping
Drawdown 150 Feet Specific Capacity 2 Gals. per min. per ft. of drawdown
How Pumped air How measured weir
Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Industrial AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No X
Taste slightly salty? odor none red color clear Temp. _____ of _____
12. LOG 55' overburden, 55'-300' sandstone Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Somerville Well Drilling Co.
14. DATA OBTAINED BY Same Date 8/9/65

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

850131020

26-13-775

Form 87

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 26-4136
Application No. _____
County _____

WELL RECORD

1. OWNER Fairmount Chemical Co. ADDRESS 117 Blanchard Street, Newark, N.J.
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Newark, Essex County
3. DATE COMPLETED 9/18/68 DRILLER Somerville Well Drilling Co.
4. DIAMETER: top 12 inches Bottom 8 inches TOTAL DEPTH 250 Feet
5. CASING: Type Drive Diameter 8" inches Length 74 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
- Tail piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 9/18/67 Yield 200 Gallons per minute
Static water level before pumping 70 Feet below surface
Pumping level 210 feet below surface after _____ hours pumping
Drawdown 140 Feet Specific Capacity 2 Gals. per min. per ft. of drawdown
How Pumped air test How measured _____
Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pum. in well _____ Feet Depth of Footplace in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR cooling AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER good Sample: Yes _____ No xx
Taste none Odor none Color clear Temp. _____ °F
12. LOG graphite Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Somerville Well Drilling Co.
14. DATA OBTAINED BY same Date 3/8/68

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

850131021

26 13 775

Form 87

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY
WELL RECORD

Permit No. 26-1940
Application No. _____
County _____

1. OWNER Eureka Const. & Equip. Co. ADDRESS 1714 Franklin St.
Owner's Well No. _____ SURFACE ELEVATION 1250 Feet
(Above mean sea level)
2. LOCATION San Diego, Cal.
3. DATE COMPLETED Jan. 23, 1959 DRILLER Andy Johnson
4. DIAMETER: top _____ inches Bottom 6 inches TOTAL DEPTH 500 Feet
5. CASING: Type Steel Diameter 8 inches Length 90 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
Tail piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date Jan. 23, 1959 Yield 70 Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level 100 feet below surface after 10 hours pumping
Drawdown 100 Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How Pumped Surfline How measured Surfline
Observed effect on nearby wells None
9. PERMANENT PUMPING EQUIPMENT:
Type Surfline Mfrs. Name DeLong
Capacity 75 G.P.M. How Driven electric H.P. 15 R.P.M. 1750
Depth of Pump in well 300 Feet Depth of Footpiece in well 30 Feet
Depth of Air Line in well no Feet Type of Motor on Pump no Size _____ inches
10. USED FOR Cooling AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes X No. _____
Taste no Odor no Color clear Temp. 84 °F
12. LOG log, sand and rock and shale Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Advanced Well Drilling Co. Inc.
14. DATA OBTAINED BY James J. Johnson Date Jan. 1, 1960

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

(255)

WU 87-10a

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

26-13-77511

Permit No. 26-1783

Application No. _____

County _____

WELL RECORD

1. OWNER NEWARK PARAFFINE CO ADDRESS 70 BLANCHARD ST
Owner's Well No. #1 SURFACE ELEVATION 10 Feet
(Above mean sea level)
2. LOCATION 70 BLANCHARD, NEWARK
3. DATE COMPLETED APRIL 10, 1958 DRILLER P. CHAFITELLI
4. DIAMETER: top 8 inches Bottom 8 inches TOTAL DEPTH 503 Feet
5. CASING: Type BLACK STAN. Diameter 8 inches Length 70 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range { Top _____ Feet Geologic Formation T.R.B
Bottom _____ Feet
- Tail piece. Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date APRIL 10, 58 Yield 102 GPM Gallons per minute
Static water level before pumping 26' Feet below surface
Pumping level 160' feet below surface after 3 hours pumping
Drawdown 134' Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How Pumped SUBMERSIBLE How measured AIR LINE
Observed effect on nearby wells NONE
9. PERMANENT PUMPING EQUIPMENT:
Type SUBMERSIBLE Mfrs. Name MEYERS
Capacity 150 G.P.M. How Driven MOTOR H.P. 15 R.P.M. _____
Depth of Pump in well 200 Feet _____ Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet _____ Depth of Motor on Pump _____
10. USED FOR INDUSTRIAL AMOUNT Average 800 Gallons Daily
Maximum 900 Gallons Daily
11. QUALITY OF WATER OK Sample: Yes _____ No _____
Taste OK Odor NONE Color CLEAR Temp. _____ °F
12. LOG 0-15 CLAY, STONE 15-503 SAND Are samples available NO
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY P. CHAFITELLI Date APRIL 15, 1958

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
Division of Water Policy & Supply
WELL RECORD

26-13.778
Permit No. 26-429
Application No. _____
County _____

1. OWNER ARCEN CHEMICAL CO. ADDRESS 60 BLANCHARD ST. NEWK, N.J.
Owner's Well No. NO. #1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION ADORE
3. DATE COMPLETED 3-18-52 DRILLER S. D'ALESSIO GARDEN STATE ART. WELL & PUMP CO.
4. DIAMETER: Top 8 Inches Bottom 8 Inches TOTAL DEPTH 400 Feet
5. CASING: Type DRIVE-PIPE Diameter 8 Inches Length 90 Feet
Size of
6. SCREEN: Type NONE Opening _____ Diameter _____ Inches Length _____ Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
Tail piece. Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY NO Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date MARCH 19, 1952 Yield 90 Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level 120 feet below surface after 8 hours pumping
Drawdown 99 Feet Specific Capacity 1.1 Gals. per min. per ft. of drawdown
How Pumped: DEEP WELL TURBINE How measured AIR LINE & GAUGE
Observed effect on nearby wells NO OBSERVATIONS MADE
9. PERMANENT PUMPING EQUIPMENT: NONE
Type _____ Capacity _____ Gallons per minute
How Driven _____ Horse Power _____ H.P.M.
Depth of pump in well _____ Feet Depth of Foot piece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____
10. USED FOR INDUSTRIAL AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER GOOD Sample: Yes _____ No. ✓
Taste NO Odor NO Color CLEAR Temperature ? °F
12. LOG CLAY MATRIX - SOFT SHALE - RED SHALE Are samples available? YES
(Give details on back of sheet or on separate sheet)
13. SOURCE OF DATA BAIL
14. DATA OBTAINED BY DRILLER DATE 3/18/52

(Note: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131023

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.1/2
PERMIT NO. 26-5034
APPLICATION NO. _____
COUNTY Hudson

WELL RECORD

07304

1. OWNER Coca Cola Col ADDRESS P.O. Box B, Bergen St. Jersey City, NJ
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot 6, Block 295, Lincoln Hwy. & Hackensack Ave., Kearny, Hudson
3. DATE COMPLETED 5/1/81 DRILLER Somerville Well Drilling Co., Inc.
4. DIAMETER: Top 10 inches Bottom 6 inches TOTAL DEPTH 650 Feet
5. CASING: Type drive Diameter 6 inches Length 100 Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date 5/1/81 Yield 20 Gallons per minute
Static water level before pumping 25 Feet below surface
Pumping level 400 feet below surface after 8 hours pumping
Drawdown 375 Feet Specific Capacity 18.75 Gals. per min. per ft. of drawdown
How pumped air How measured well
Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. Hwv Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR domestic AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER N/A Sample: Yes _____ No xx
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG top soil to 3' 3-95 clay, 95 - depth red shale Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Somerville Well Drilling Co., Inc.
14. DATA OBTAINED BY Same Date 5/1/81

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131024

11/86

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO. 260975-7

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-1 SURFACE ELEVATION _____ Feet
(Above Mean Sea Level)
2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445
3. DATE COMPLETED 10/14/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 62.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 52.0 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10.0 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Use details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY J. J. JAWORSKI #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131025

11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO 2609616-5

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)

2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445

3. DATE COMPLETED 10/8/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 16.0 Feet

5. CASING: Type PVC Diameter 4 inches Length 16.0 Feet

6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet

Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(Note: Attach on back of sheet or on separate sheet. If separate log was made, please furnish copy.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Jeffrey Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131026

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO 2609677-3

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445
3. DATE COMPLETED 10/9/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 55.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 45.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jerry Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131027

Form 11/82

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

2623-113
PERMIT NO. 2609678-1

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-8 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/16/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 46.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 36.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Use details on back of sheet or on separate sheet. If separate log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey J. Jankowski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131028

11/86

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO 260964-0

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-11 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 14.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 8.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 6.0 Feet
Range in Depth { Top _____ Feet Geologic Formation _____
Bottom _____ Feet
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ (Give details on back of sheet or on separate sheet. If storage log was made, please furnish copy.) Are samples available? _____
13. SOURCE OF DATA _____
14. DATA OBTAINED BY RICHARD EMPSON #1312 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, cross map, sketch of special casing arrangements, etc.)

850131029

11/86

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23 113 2607680-3

PERMIT NO

APPLICATION NO

COUNTY ESSEX

FOR MONITORING PURPOSES ONLY

WELL RECORD

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-5 SURFACE ELEVATION _____ Feet:
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 46.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 36.0 Feet
6. SCREEN: Type PVC Size of Opening 010 Diameter 4 inches Length 10.0 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If separate log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey Jaworski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131030

11/85

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO. 2609681-1

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-9 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 12/16/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 19.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 9.0 Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If concrete log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey J. Jurewski #1325 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131031

11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO

2609703

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO

COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-6 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/13/80 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 16.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 6.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hour: pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY J. J. JAWORSKI #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131032

11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26 23 113
PERMIT NO 2609744

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-7 SURFACE ELEVATION _____ Feet
2. LOCATION LOT: 20, 21, 22, 23 BLOCK: 2445 (Show map and lot!) Feet
3. DATE COMPLETED 10/13/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 11.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 6.0 Feet
6. SCREEN: Type PVC Size of Opening 010 Diameter 4 inches Length 50 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Minimum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If details log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY BURROUGHS #1312 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131033

11/86

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113 2609850
PERMIT NO. 2609850

FOR MONITORING
PURPOSES ONLY

WELL RECORD

APPLICATION NO. _____

COUNTY ESSEX

1. OWNER NL SPENCER KELLOGG, INC. ADDRESS 1230 AVENUE OF THE AMERICAS
NEW YORK, NEW YORK 10020
Owner's Well No. MW-23 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION LOT: 9611 BLOCK: 5070
3. DATE COMPLETED 11/25/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 38.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 28.0 Feet
6. SCREEN Type PVC Size of Opening .010 Diameter 4 inches Length 11.0 Feet
DOUBLE CASED - 8" CASING TO 10.5'
Range in Depth { Top _____ Feet Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY JEFFREY JAWORSKI #1315 Date 12/10/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131034

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7445

APPLICATION NO. _____

COUNTY Essex

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
- Owner's Well No. P-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/21/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
- Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
- Static water level before pumping _____ Feet below surface
- Pumping level _____ feet below surface after _____ hours pumping
- Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
- How pumped _____ How measured _____
- Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
- Type _____ Mfrs. Name _____
- Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
- Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
- Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
- Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/21/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131035

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶
PERMIT NO. 26-7446
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SLOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/22/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131036

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7447

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/26/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SLOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/26/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131037

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7448

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SLO Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR: _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/22/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131038

11/80

FOR MONITORING
PUMPED TREATMENT

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶

PERMIT NO. 26-7449

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/25/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20/40 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/25/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131039

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶
PERMIT NO. 26-7450
APPLICATION NO. _____
COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-6 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/25/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PLX Size of Opening 205/10 Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Brown Date 2/25/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131040

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623

PERMIT NO. 26-7451

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER DUPONT-CHEMICAL ADDRESS EXIT 15E TURNPIKE
Owner's Well No. P-7 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 2/22/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10.0 Feet
5. CASING: Type PVC Diameter 2 inches Length 2.5 Feet SU
6. SCREEN: Type PVC Size of Opening 20 SLOT Diameter 2 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Tom Bawa Date 2/22/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131041

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶
PERMIT NO. 26-7914
APPLICATION NO. _____
COUNTY Essex

**FOR MONITORING
PURPOSES ONLY**

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-8 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/12/83 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 + 27 Feet STICKUP
5. CASING: Type PVC Diameter 2 inches Length 27 Feet
6. SCREEN: Type PVC Size of Opening 105/10 Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/12/83

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131042

Form DWR-138
1-780

FOR MONITORING
PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623¹¹⁶~~684~~

PERMIT NO. 26-7915

APPLICATION NO. _____
Essex

COUNTY _____

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-9 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/13/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 10 + 2 Feet Shut up
5. CASING: Type PUC Diameter 2 inches Length 2 Feet
6. SCREEN: Type PUC Size of Opening 10 SLOT Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet; Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USEC FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/13/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131043

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623¹¹⁶
PERMIT NO. 26-7916
APPLICATION NO. _____
COUNTY Essex

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-10 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/13/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 Inches Bottom 2 Inches TOTAL DEPTH 10 Feet
5. CASING: Type PVC Diameter 2 Inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 10 SLOT Diameter 2 Inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If sleeve log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/13/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131044

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶ ~~116~~

PERMIT NO. 26-7917

APPLICATION NO. _____

COUNTY Essex

FOR MONITORING
PURPOSES ONLY

WELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE

Owner's Well No. P-11D SURFACE ELEVATION _____ Feet
(Above mean sea level)

2. LOCATION Lot: _____ Block: _____ Municipality: Newark

3. DATE COMPLETED 8/20/85 DRILLER Empire Soils Investigations

1. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 38.5 Feet

5. CASING: Type PVC Diameter 4 inches Length 28.5 Feet

6. SCREEN: Type PVC Size of Opening 10 SLOT Diameter 4 inches Length 10 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfr. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Empire Soils Investigations Date 8/20/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131045

**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623 ¹¹⁶ ~~072~~

PERMIT NO. 26-7918

APPLICATION NO. _____

COUNTY EssexWELL RECORD

1. OWNER DUPONT CHEMICAL ADDRESS EXIT 15E-TURNPIKE
Owner's Well No. P-11-S SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED 8/14/85 DRILLER Empire Soils Investigations
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH _____ Feet
5. CASING: Type PVC Diameter 2 inches Length _____ Feet
6. SCREEN: Type PVC Size of Opening 10 SLOT Diameter 2 inches Length 10 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR: _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Empire Soils Investigations Date 8/14/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131046

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORD: 26.23.1.25

PERMIT NO. 26 11916-1

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER NL Spencer Kellog, Inc. ADDRESS New York, New York 07105
Owner's Well No. MW-16 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 9 & 11 Block: 5070
3. DATE COMPLETED 11/13/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 5.5' Feet
5. CASING: Type PVC Diameter 4 inches Length 2.5' Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 4 inches Length 3.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes Only AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jon Yeaton #1415 Date December 7, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131047

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORD: 26.23.1.25

PERMIT NO. 261417-0

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER NL Spencer Kellog, Inc. ADDRESS New York, New York 07105
Owner's Well No. MW-19 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 9 & 11 Block: 5070
3. DATE COMPLETED 11/2/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 5.0' Feet
5. CASING: Type PVC Diameter 4 inches Length 2.5' Feet
6. SCREEN: Type PVC Size of Opening 1/10 Diameter 4 inches Length 2.5' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes Only AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jon Yeaton #1415 Date December 7, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131048

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6702

APPLICATION NO. _____

COUNTY Hudson

FOR OBSERVATION
PURPOSES ONLY

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co. Inc.
4. DIAMETER: Top _____ Inches Bottom _____ Inches TOTAL DEPTH 11 Feet
5. CASING: Type _____ Diameter 2 Inches Length 1 Feet
6. SCREEN: Type PV Size of Opening 30 Diameter 2 Inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation SAND SILT
- Well Place: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.96 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER 7 Sample: Yes _____ No _____
Taste 7 Odor YES Color CLEAR Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Note details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS CATEK Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131049

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6703

APPLICATION NO. _____

COUNTY Hudson

**FOR OBSERVATION
PURPOSES ONLY**

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 2 SURFACE ELEVATION _____ Feet
(above mean sea level)
2. LOCATION Lot _____ Block _____ Municipality Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co. Inc.
4. DIAMETER: Top 2 inches Bottom _____ inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation SILT CLAY
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.50 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes _____ No _____
Taste ? Odor YES Color CLEAR Temp. 1 °F.
12. LOG _____ Are samples available? YES
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONTICR Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131050

**OBSERVATION
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6704

APPLICATION NO. _____

COUNTY Hudson

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot _____ Block _____ Municipality: Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co., Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation SILT CLAY. SAND.
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 10.75 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER P Sample: Yes _____ No _____
Taste ? Odor yes Color clear Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If chemical log was made, please furnish copy.)
13. SOURCE OF DATA Official
14. DATA OBTAINED BY Louis Carter Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131051

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623123

PERMIT NO. 26-6755

APPLICATION NO. _____

COUNTY Hudson

FOR OBSERVATION
PURPOSES ONLY

WELL RECORD

1. OWNER S & W WASTE, INC. ADDRESS 115 JACOBUS AVE.
Owner's Well No. SW 4 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Kearny Town
3. DATE COMPLETED 4-20-84 DRILLER Diamond Drilling Co., Inc.
4. DIAMETER: Top 2 inches Bottom _____ inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 10 Feet
Range in Depth { Top _____ Feet Bottom _____ Feet Geologic Formation SAND & CLAY
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.95 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes ☒ No ☒
Taste ? Odor Y:? Color SLIGHT Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONICK Date 4-20-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131052

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.123

PERMIT NO. 26-7392

APPLICATION NO. _____

COUNTY _____

**FOR OBSERVATION
PURPOSES ONLY**

WELL RECORD

1. OWNER S.W. WASTE INC ADDRESS 115 JEROME AVE S. KENNY N.J.
Owner's Well No. 5 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION 115 JEROME AVE SOUTH KENNY N.J. 07032
3. DATE COMPLETED 12-14-84 DRILLER LOUIS ONTCH DIAMOND DRILLING CORP
4. DIAMETER: Top 2 Inches Bottom 2 Inches TOTAL DEPTH 11 Feet
5. CASING: Type PVC Diameter 2 Inches Length 1 Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 Inches Length 10 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation SAND & SILTY CLAY
- Tail Piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping 1.84' Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ Inches
10. USED FOR OBSERVATION AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER ? Sample: Yes _____ No _____
Taste ? Odor YES Color CLOUDY Temp. _____ OF.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA DRILLER
14. DATA OBTAINED BY LOUIS ONTCH Date 12-14-84

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131053

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-10622
PERMIT NO. 26-10622
APPLICATION NO. 26-10622

WELL RECORD

COUNTY NEWARK

1. OWNER International Machine ADDRESS 196 Blankinard St Newark N.J.
Owner's Well No. MW-1 SURFACE ELEVATION Feet
2. LOCATION Same
3. DATE COMPLETED 5/6/87 DRILLER Summit Drilling
4. DIAMETER: Top 8" inches Bottom 8" inches TOTAL DEPTH 12'-0" Feet
5. CASING: Type PVC Diameter 4" inches Length 1'-0" Feet
6. SCREEN: Type PVC Size of Opening 20/40 Diameter 4" inches Length 1'-0" Feet

Range in Depth { Top Feet
Bottom 12' Feet
Geologic Formation Fill

Tail Piece Diameter N/A inches Length Feet

7. WELL FLOWS NATURALLY N/A Gallons per minute at Feet above surface

Water rises to Feet above surface

8. RECORD OF TEST: Date N/A Yield Gallons per minute

Static water level before pumping Feet below surface

Pumping level feet below surface after hours pumping

Drawdown Feet Specific Capacity Gals. per min. per ft. of drawdown

How pumped How measured

Observed effect on nearby wells

9. PERMANENT PUMPING EQUIPMENT

Type N/A Mfrs. Name

Capacity G.P.M. How Driven H.P. R.P.M.

Depth of Pump in well Feet Depth of Footpiece in well Feet

Depth of Air Line in well Feet Type of Motor on Pump Size inches

10. USED FOR Monitor AMOUNT { Average Gallons Daily
Maximum Gallons Daily

11. QUALITY OF WATER Sample: Yes No

Taste Odor Color Turb. of.

12. LOG Are samples available?
(See details on back of sheet or on separate sheet. If drawing log was made, please furnish copy.)

13. SOURCE OF DATA

14. DATA OBTAINED BY Summit Drilling Date 5/6/87

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131054

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-10623
PERMIT NO. 26-10623
APPLICATION NO. _____
COUNTY _____

WELL RECORD

1. OWNER International Metallurgical ADDRESS 1st Blawie St Newark
Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Same
3. DATE COMPLETED 5/6/82 DRILLER Summit Drilling Co. Inc
4. DIAMETER: Top 8" inches Bottom 8" inches TOTAL DEPTH 12' Feet
5. CASING: Type P.V.C Diameter 4" inches Length 1'-0" Feet
6. SCREEN: Type P.V.C Size of Opening 20 mesh Diameter 4" inches Length 12'-0" Feet
- Range in Depth: { Top _____ Feet
Bottom 12' Feet
- Geologic Formation FIH
- Well Pipe Diameter N.A. inches Length _____ Feet
7. WELL FLOWS NATURALLY N.A. Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST Date N.A. Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT N.A.
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitor AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(One drawn on back of sheet or on separate sheet. If separate log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Summit Drilling Date 5/6/82

(NOTE: Use other side of this sheet for additional information such as log of material's penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611462-3

APPLICATION NO. _____


COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1A SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/11/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 15.0 Feet
5. CASING: Type STAINLESS STEEL Diameter 4 inches Length 5.0 Feet
6. SCREEN: Type " " Size of Opening OIS Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ F.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Ketter #1316 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131056

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP | EMPIRE

FIELD LOG | MOLE NO. <i>24214</i> |
|----------------|------|--------------|------------|---------|------|-------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <i>9-10-87</i> | | <i>0</i> | <i>50</i> | | | | GRD. ELEV. <i>10.15</i> |
| <i>9-11-87</i> | | <i>50</i> | <i>60</i> | | | | <i>30.15</i> |

PROJECT _____ LOCATION _____ Sheet 1 of 2

| DEPTH OF SAMPLE | SAMPLE NO | BLOWS ON SAMPLER | | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
|-----------------|-----------|------------------|----|----|----|---|-------------------|----------|-------|-----------------|----------------------------------------|------------|--------------|
| | | 0 | 6 | 12 | 18 | N | | | | | | | |
| 0-2 | 1 | 1 | 2 | | | | | | Br | 4 | Fill Silty - Wood P.C. Sand. | | |
| 2-4 | 2 | 14 | 15 | | | | | | Br | 6 | Fill Silty Fill | | |
| 4-6 | 3 | 7 | 9 | | | | | | | 29 | misc. Fill containing 10 organic | | |
| 6-8 | 4 | 14 | 31 | | | | | | | 10 | 2m Fill turn into Red/Br F. Sand. | | |
| 8-10 | 5 | 16 | 34 | | | | | W | | 6 | F. m gr | | |
| 10-12 | 6 | 22 | 4 | | | | | W | | 2 | Red/Br F. sand F. m gr | | |
| | | | | | | | | | | | | | |
| 15-17 | 7 | 9 | 6 | | | | | W | | 10 | Red/Br F. Sand F. m gr | | |
| | | | | | | | | | | | | | |
| 20-22 | 8 | 13 | 14 | | | | | W | | 24 | Red/Br F. m Sand w/some SILT | | |
| | | | | | | | | | | | | | |
| 25-27 | 9 | 21 | 16 | | | | | W | | 24 | Red/Br F. m Sand some silt = clay | | |
| | | | | | | | | | | | | | |
| 30-32 | 10 | 12 | 20 | | | | | W | | 24 | Red/Br F. sand and silt with some clay | | |
| | | | | | | | | | | | | | |
| 35-37 | 11 | 30 | 32 | | | | | W | | 24 | Red/Br F. Sand and silt some clay | | |
| | | | | | | | | | | | | | |

DRILLERS CLASSIFICATION

NOTATION: SIZE AUGERS/CASING 4 in SIZE SPOON 2
 SIZE THIN-WALLED TUBE 3 in SIZE CORE NA

N = NO. OF BLOWS TO DRIVE "SPOON" WITH LB. WEIGHT FALLING PER BLOW
 C = NO. OF BLOWS TO DRIVE "CASING" WITH LB. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850131057

[illegible]

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO.

2611463-1

APPLICATION NO.

COUNTY Essex

WELL RECORD

1. OWNER Delect Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1B SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 42.0' Feet
5. CASING: Type STAINLESS STEEL Diameter 4 inches Length 32.0' Feet
6. SCREEN: Type " " Size of Opening 0.15 Diameter 4 inches Length 10.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.S.I.
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris Strangness #1419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131059

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO.

2611464-0

APPLICATION NO.

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1C SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/12/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 8 inches Bottom 8 inches TOTAL DEPTH 77.0' Feet
5. CASING: Type STAINLESS STEEL Diameter 8 inches Length 67.0' Feet
6. SCREEN: Type NO SCREEN Diameter _____ inches Length 0 feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ F.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris O'Shaughnessy #419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131060

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611465

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. CB-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/14/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 12.0' Feet
6. SCREEN: Type PVC Size of Opening 210 Diameter 2 inches Length 5.0' Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.S.I.
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Kottler #1316 Date October 9, 1987

NOTE: Use reverse side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131061

26,11465

850131062

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

COORD: 26.13.7.77

PERMIT NO. 2611466

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Delect Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. CB-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/03/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 6.0' Feet
6. SCREEN: Type PVC Size of Opening 0.15 Diameter 2 inches Length 5.0' Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
9. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
1. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.M.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
- QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ OF.
- LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
DATA OBTAINED BY Chris O'Shaughnessy #1419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131063

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611467

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. SB-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/14/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 13.0' Feet
6. SCREEN: Type PVC Size of Opening 010 Diameter 2 inches Length 5.0' Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Ketter #1316 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131064

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coordinate #:

26.13.7.77

WELL RECORD

WELL NO. 2001524

APPLICANT NAME _____

COUNTY Essex

OWNER City of Newark ADDRESS Newark, New Jersey

Owner's Well No. CB-3 SURFACE ELEVATION _____ Feet

LOCATION Lot: 16 Block: 5001

DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0 Feet

CASING: Type PVC Diameter 2 inches Length 13.0 Feet

SCREEN: Type PVC Size of Opening 210 Diameter 2 inches Length 5.0 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet

Geologic Formation _____

Test Piece: Diameter _____ inches Length _____ Feet

WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

RECORD OF TEST: Discharge NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

PERMANENT PUMPING EQUIPMENT:

Type NONE Mfg. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ P.M.P. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily

Maximum _____ Gallons Daily

QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

LOG _____ Any samples available? _____

(If no samples are available, state reason why no samples were taken, such as pump failure, etc.)

SOURCE OF DATA Chris O'Shaughnessy #1419 October 9, 1987

DATE OBTAINED BY _____

NOTES: The owner of this well is responsible for the maintenance and proper use of the well and its equipment. The Department of Environmental Protection does not assume any liability for the use of this well.

850131065

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCESWELL NO. 2611525

Coordinate #:

APPLICATION NO. _____

26-13.7.77

WELL RECORD

COUNTY Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey
 OWNER'S Well No. OB-4 SURFACE ELEVATION _____ Feet
 Lot: 16 Block: 5001
2. LOCATION _____
3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: TOP 2 inches SIGHT 2 inches TOTAL DEPTH 11.0' Feet
5. CASING: TYPE PVC Diameter 2 inches Length 6.0' Feet
6. SCREEN: TYPE PVC Size of Opening 0.15 Diameter 2 inches Length 5.0' Feet

Range in Depth { Top _____ Feet
 Bottom _____ Feet
 Geologic Formation _____

Top Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Crowdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of crowdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfg. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
 Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Samples: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Any samples available? _____
 (Form requires an analysis of water at or near the well. If analysis is not done, please furnish report.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Chris Oshrymsy # 1419 Date October 9, 1987

NOTE: The State of New Jersey is not responsible for the accuracy or completeness of the information furnished by the user of this form. The user of this form is responsible for the accuracy and completeness of the information furnished.

850131066

1762

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCESWELL NO: 2611526

Coordinate #:

26-13.5777

WELL RECORD

APPLICATION NO. _____

COUNTY Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey
 Owner's Well No. OB-5 SURFACE ELEVATION _____ Feet
 Lot: 16 Block: 5001
2. LOCATION 9102187 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
3. DATE COMPLETED _____
4. DIAMETER: TOP 2 inches BORE 2 inches TOTAL DEPTH 11.0 Feet
5. CASING: TYPE PVC Diameter 2 inches Length 6.0 Feet
6. SCREEN: TYPE PVC Size of Opening 0.15 Diameter 2 inches Length 5.4 Feet
- Range in Depth { Top _____ Feet Geologic Formation _____
 Bottom _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
 Water rises to _____ Feet above surface
8. RECORD OF TESTS: Date NONE Yield _____ Gallons per minute
 Static water level before pumping _____ Feet below surface
 Pumping level _____ feet below surface after _____ hours pumping
 Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
 How pumped _____ How measured _____
 Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT: NONE
 Type _____ Mfg. Name _____
 Capacity _____ G.P.M. How Driven _____ H.P. _____ P.M.P. _____
 Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
 Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
 Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Samples: Yes _____ No _____
 Taste _____ Odor _____ Color _____ Turbidity _____
12. LOG _____
 (See legend on back of form for meaning of symbols used in log and notes, and for proper use of log.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris O'Shaughnessy #1419 Date October 9, 1987

NOTE: The owner of this well is responsible for the maintenance of the well and for the protection of the well from contamination.

850131067

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611462-3

APPLICATION NO. _____


COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1A SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/11/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 15.0 Feet
5. CASING: Type STAINLESS STEEL Diameter 4 inches Length 5.0 Feet
6. SCREEN: Type " " Size of Opening 0.15 Diameter 4 inches Length 10.0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.W.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Ketter #1316 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131068

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP |  | HOLE NO. <u>14114</u> |
|---------|------|--------------|------------|---------|------|------------------------------------------------------------------------------------|----------------------------|
| 9-10-87 | | 0 | 50 | | | | GRD. ELEV. <u>2613.711</u> |
| 9-11-87 | | 50 | 60 | | | | <u>2611.125</u> |
| | | | | | | | |

FIELD LOG

PROJECT _____ LOCATION _____ Sheet 1 of 2

| DEPTH OF SAMPLE | SAMPLE NO | BLOWS ON SAMPLER | | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
|-----------------|-----------|------------------|----|----|----|---|-------------------|----------|-------|-----------------|----------------------------------------|------------|--------------|
| | | 0 | 6 | 12 | 18 | N | | | | | | | |
| 0-2 | 1 | 1 | 2 | | | | | | Br | 4 | Fill SILT. - Wood P. & Sand. | | |
| 2-4 | 2 | 14 | 15 | | | | | | Br | 6 | Fill silty Fill | | |
| 4-6 | 3 | 7 | 9 | | | | | | | 29 | Misc. Fill containing inorganic | | |
| 6-8 | 4 | 14 | 31 | | | | | | | 10 | 2m Fill turn into Red/Br F. Sand. | | |
| 8-10 | 5 | 16 | 34 | | | | | W | | 6 | F. m gr | | |
| 10-12 | 6 | 26 | 4 | | | | | W | | 2 | Red/Br F. sand F. m gr | | |
| 12-14 | 7 | 9 | 6 | | | | | W | | 10 | Red/Br F. Sand F. m gr | | |
| 14-16 | 8 | 13 | 14 | | | | | W | | 24 | Red/Br F. m Sand w/ some SILT | | |
| 16-18 | 9 | 27 | 16 | | | | | W | | 24 | Red/Br F. m Sand some SILT = clay | | |
| 18-20 | 10 | 12 | 20 | | | | | W | | 24 | Red/Br F. sand and SILT with some clay | | |
| 20-22 | 11 | 30 | 32 | | | | | W | | 21 | Red/Br F. Sand and SILT some clay | | |


DRILLERS CLASSIFICATION

NOTATION: SIZE AUGERS/CASING 4 in SIZE SPOON 2
 SIZE THIN-WALLED TUBE 3 in SIZE CORE NA

N = NO. OF BLOWS TO DRIVE "SPOON" "WITH" LB. WEIGHT FALLING PER BLOW
 C = NO. OF BLOWS TO DRIVE "CASING" "WITH" LB. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850131069

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP |  | HOLE NO. <u>mw/4</u> |
|------|------|--------------|------------|---------|------|------------------------------------------------------------------------------------|---------------------------|
| | | | | | | | GRD. ELEV. <u>2613.77</u> |
| | | | | | | FIELD LOG | <u>261462-3</u> |

PROJECT _____
 LOCATION _____ Sheet 2 of 2

| DEPTH OF SAMPLE | SAMPLE NO. | BLOWS ON SAMPLER | | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
|-----------------|------------|------------------|----|----|----|----|-------------------|----------|-------|-----------------|-------------------------------------|------------|--------------|
| | | 0 | 6 | 12 | 18 | 4 | | | | | | | |
| 10.42 | 1238 | 33 | | | | | | | W | 27 | Red/Br med-sand | Some Silty | |
| | | | | | | 21 | 37 | | | | | | |
| 15.47 | 13 | 9 | 10 | | | | | | W | 26 | Fine Red/Br sand Very Silty clay | | |
| 47.47 | | | | 11 | 16 | | | | | | 3 in Tube No Rec | | |
| 50.52 | 14 | 10 | 9 | | | | | | W | 22 | Red/Br sand Fine Silty clay | | |
| | | | | 8 | 8 | | | | | | Cone F. gr | | |
| 55.57 | 15 | 15 | 16 | | | | | | | 20 | Red/Br Silty clay | With C, gr | |
| | | | | 15 | 31 | | | | | | 58Ft Hlt Pack; | | |
| 60.62 | 16 | 100 | 20 | | | | | | | | | | |

DRILLERS CLASSIFICATION

NOTATION: SIZE AUGERS/CASING _____ SIZE SPOON _____
 SIZE THIN-WALLED TUBE _____ SIZE CORE _____

N = NO. OF BLOWS TO DRIVE "SPOON" "WITH" LB. WEIGHT FALLING PER BLOW
 C = NO. OF BLOWS TO DRIVE "CASING" "WITH" LB. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO.

2611463-1

APPLICATION NO.

COUNTY Essex

WELL RECORD

1. OWNER Delect Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1B SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 42.0' Feet
5. CASING: Type STAINLESS STEEL Diameter 4 inches Length 32.0' Feet
6. SCREEN: Type " " Size of Opening 0.5 Diameter 4 inches Length 10.0' Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.W.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Charles Shrago #1419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131071

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO.

2611464-0

APPLICATION NO.

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. MW-1C SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/12/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 8 inches Bottom 8 inches TOTAL DEPTH 77.0' Feet
5. CASING: Type STAINLESS STEEL Diameter 8 inches Length 67.0' Feet
6. SCREEN: Type NO SCREEN Diameter _____ inches Length 0 Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris C. Shaugnessy #419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131072

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611465

APPLICATION NO. _____

COUNTY Essex


WELL RECORD

1. OWNER Delect Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. CB-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/14/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 17.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 12.0' Feet
6. SCREEN: Type PVC Size of Opening 20 Diameter 2 inches Length 5.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Whitaker Ketter #1316 Date October 9, 1987

(NOTE: Use reverse side of this sheet for additional information such as log of materials penetrated,
analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131073

26.13 7.77 26.11465

| DATE | TIME | DRILLED FROM | DRILLED TO | WEATHER | TEMP |  | HOLE NO. <u>C.B-7</u> | | | | | |
|-------------------------|------------|-----------------|------------|---------|-------|------------------------------------------------------------------------------------|-----------------------|-------|-----------------|---------------------------------------|------------|--------------|
| | | | | | | | GRD. ELEV. _____ | | | | | |
| FIELD LOG | | | | | | | | | | | | |
| PROJECT _____ | | | | | | | | | | | | |
| LOCATION _____ | | | | | | Sheet <u>1</u> of <u>1</u> | | | | | | |
| DEPTH OF SAMPLE | SAMPLE NO. | BLOWS ON SAMPLE | | | | BLOWS ON CASING C | MOISTURE | COLOR | SAMPLE RECOVERY | CLASSIFICATION OF MATERIALS DRILLED | OTHER DATA | WELL DETAILS |
| | | 0-4 | 4-8 | 8-12 | 12-16 | | | | | | | |
| 0-2 | 1 | 5 | 2 | | | | | | | Red/Bk S.Ltz Clay Tr. F.11 | | |
| 2-4 | 2 | 14 | 11 | | | | | | | Red/Bk S.Ltz Clay Same misc Fill | | |
| 4-6 | 3 | 7 | 4 | | | | | | | Frag - Br S.Ltz - F.11 & S.4 misc | | |
| 6-8 | 4 | 12 | 10 | | | | | | | Red/Bk S.Ltz w. H. F.11 & through det | | |
| 8-10 | 5 | 25 | 35 | | | | | | | Red/Bk S.Ltz with F.11 misc - cement | | |
| 10-12 | 6 | 19 | 12 | | | | | | | Red/Bk S.Ltz - F.11 - wood - Br. C.15 | | |
| 12-14 | 7 | 4 | 6 | | | | | | | w. 9 cc 13 Ft. m.c. Sand w. F. m gr | | |
| 14-16 | 8 | 4 | 6 | | | | | | | Bottom mod F.11 14.5 | | |
| 16-18 | 9 | 5 | 10 | | | | | | | Red S.Ltz Sand - gr | | |
| 18-20 | 10 | 3 | 5 | | | | | | | Red S.Ltz Sand F.C. with F. m gr | | |
| | | | | | | | | | | Red S.Ltz Sand F.C. to V. m gr C | | |
| | | | | | | | | | | with F.C. gr | | |
| DRILLERS CLASSIFICATION | | | | | | | | | | | | |

NOTATION: SIZE AUGERS/CASING 3 3/4 cm SIZE SPOON 2
 SIZE THIN-WALLED TUBE act SIZE CORE act

N = NO. OF BLOWS TO DRIVE "SPOON" "WITH" LB. WEIGHT FALLING PER BLOW
 C = NO. OF BLOWS TO DRIVE "CASING" "WITH" LB. WEIGHT FALLING PER BLOW

FILL OUT BACK OF LOG AND SIGN YOUR NAME

850131074

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611466

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. CB-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/03/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 11.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 6.0' Feet
6. SCREEN: Type PVC Size of Opening 0.15 Diameter 2 inches Length 5.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ F.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris O'Shaughnessy #1419 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131075

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 26.13.7.77

PERMIT NO. 2611467

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER Deleet Merchandising Corp. ADDRESS Newark, New Jersey
Owner's Well No. SB-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5001
3. DATE COMPLETED 9/14/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0' Feet
5. CASING: Type PVC Diameter 2 inches Length 13.0' Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 2 inches Length 5.0' Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type NONE Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ F.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Kottler #1316 Date October 9, 1987

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131076

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coordinate #:

26-13.7.77

WELL RECORD

WELL NO. 2611524

APPLICATION NO. _____

COUNTY Essex

OWNER City of Newark ADDRESS Newark, New Jersey

Owner's Well No. CB-3 SURFACE ELEVATION _____ Feet

LOCATION Lot: 16 Block: 5001

DATE COMPLETED 9/10/87 DRAFTER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 18.0' Feet

CASING: TYPE PVC Diameter 2 inches Length 13.0' Feet

6. SCREEN: TYPE PVC Size of Opening 210 Diameter 2 inches Length 5.0' Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet

Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfg. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
Log begins on back of sheet or on separate sheet. If separate log and form, show format used.

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Chris O'Shaughnessy #1419 Date October 9, 1987

NOTES: The owner of this well is responsible for the proper use of the well and for the proper maintenance of the well. The user of the well should also be aware of the proper use of the well and for the proper maintenance of the well.

850131077

1402

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER RESOURCESWELL NO. 2611525

Coordinate #:

26-13.7.77

WELL RECORD

APPLICATION NO. _____

COUNTY Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey

Owner's Well No. OB-4 SURFACE ELEVATION _____ Feet

2. LOCATION Lot: 16 Block: 5001

3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: TOP 2 inches SECTION 2 inches TOTAL DEPTH 11.0' Feet

5. CASING: TYPE PVC Diameter 2 inches Length 6.0' Feet

6. SCREEN: TYPE PVC Size of Opening 0.15 Diameter 2 inches Length 5.0' Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____

Well Pipe: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hour pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfg. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ P.P.M. _____

Depth of Pump in well _____ Feet Depth of Foot Valve in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }

11. QUALITY OF WATER _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Chris O'Shaghnessy # 1419 Date October 9, 1987

NOTE: ON REQUEST OF THE BUREAU OF WATER RESOURCES, THE INFORMATION ON THIS FORM IS TO BE MADE AVAILABLE TO THE PUBLIC. THE BUREAU OF WATER RESOURCES WILL BE RESPONSIBLE FOR THE PROTECTION OF THE INFORMATION ON THIS FORM.

850131078

1982

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCESWELL NO. 2611526

Coordinate #:

26.13.77

WELL RECORD

APPLICATION NO. _____

COUNTY Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey
 Owner's Well No. OB-5 SURFACE ELEVATION _____ Feet
 Lot: 16 Block: 5001
2. LOCATION 9102187
3. DATE COMPLETED _____ DRAILER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: TOP 2 inches SIGHT 2 inches TOTAL DEPTH 11.0 Feet
5. CASING: TYPE PVC Diameter 2 inches Length 6.0 Feet
6. SCREEN: TYPE PVC Size of Coring 015 Diameter 2 inches Length 5.0 Feet
- Range in Depth { Top _____ Feet
 Screen _____ Feet
 Geologic Formation _____
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
 Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
 Static water level before pumping _____ Feet below surface
 Pumping level _____ feet below surface after _____ hours pumping
 Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
 How pumped _____ How measured _____
 Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT: NONE
 Type _____ Mfg. Name _____
 Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
 Depth of Pump in well _____ Feet Depth of Footcandle in well _____ Feet
 Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
 Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample _____ Yes _____ No _____
 Taste _____ Odor _____ Color _____ Turbidity _____
12. LOG _____ Are samples available? _____
 (Form requires an entry of sample or at least one sample log and core, when pertinent, be used)
13. SOURCE OF DATA Chris O'Shaughnessy #1419
14. DATA OBTAINED BY Chris O'Shaughnessy #1419 Date October 9, 1987

NOTES: Use entries of this form for record and information only. It is not to be used for legal purposes.
 The use of this form, without the approval of the Division of Water Resources, is prohibited.

850131079

1165

Coordinate #:

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCESWELL NO. 2611527

APPLICATION NO. _____

COUNTY Essex26.137.77WELL RECORD

1. OWNER City of Newark ADDRESS Newark, New Jersey

OWNER'S Well No. SB-1 SURFACE ELEVATION _____ Feet

2. LOCATION Lot: 16 Block: 5001

3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: TOP 2 inches SCREW 2 inches TOTAL DEPTH 20.0' Feet

5. CASING: TYPE PRC DIAMETER 2 inches LENGTH 15.0' Feet

6. SCREEN: TYPE PRC SIZE OF CORNING 010 DIAMETER 2 inches LENGTH 5.0' Feet

Range in Depth { Top _____ Feet Bottom _____ Feet } Geologic Formation _____

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water level to _____ Feet above surface

8. RECORD OF TEST: DATE NONE YIELD _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfg. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ P.S.I. _____

Depth of Pump in well _____ Feet Depth of Foot Valve in well _____ Feet

Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }

11. QUALITY OF WATER Sample Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples analyzed? _____

13. SOURCE OF DATA Walter Ketter # 1316 DATE October 9, 1987

14. DATA OBTAINED BY _____

NOTE: The State of New Jersey Department of Environmental Protection is not responsible for the accuracy of the data furnished by the owner or the user of the data.

850131080

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL TAG 2611604-9

Coordinate #:

26.13.7.77

WELL RECORD

APPLICATION NO. _____
COUNTY Essex

1. OWNER City of Newark ADDRESS Newark, New Jersey

Owner's Well No. MW-4A SURFACE ELEVATION _____ Feet

2. LOCATION Lot: 16 Block: 5001

3. DATE COMPLETED 9/09/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: TOP 4 inches Bottom 4 inches TOTAL DEPTH 17.0' Feet

5. CASING: TYPE DIAMLESS STEEL Diameter 4 inches Length 7.0' Feet

6. SCREEN: TYPE " " Size of Opening 0.15 Diameter 4 inches Length 10.0' Feet

Range in Depth { Top _____ Feet Bottom _____ Feet } Geologic Formation _____

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Discharge NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ Feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Comments from on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type NONE Mfr. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ P.P.M. _____

Depth of Pump in well _____ Feet Depth of Footvalve in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }

11. QUALITY OF WATER _____ Sample _____ Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(See legend on back of form for symbols and abbreviations used in logs and plots, please furnish legend.)

13. SOURCE OF DATA _____

14. DATA OBTAINED BY Walter Kottu # 13/6 Date October 9, 1987

NOTE: The Division of Environmental Protection is not responsible for the accuracy of data reported on this form. The user of the data, whether for public or private purposes, is solely responsible for its use.

850131081

Coordinate #: 26.13.7.78

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL NO: 2611522-1

APPLICATION NO: _____

COUNTY: Essex

WELL RECORD

1. OWNER City of Newark ADDRESS Newark, New Jersey

2. LOCATION MW-3A SURFACE ELEVATION _____ Feet

3. DATE COMPLETED 9/10/87 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.

4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 15.0' Feet

5. CASING: TYPE STAINLESS STEEL Diameter 4 inches Length 5.0' Feet

6. SCREEN: Type _____ Size of Opening 0.15 Diameter 4 inches Length 10.0' Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

8. RECORD OF TESTS: Date NONE Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT: NONE Mfg. Name _____

Type _____ Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample _____ Yes _____ No _____

Taste _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____

13. SOURCE OF DATA Chris O'Shaughnessy #419 October 9, 1987

14. DATA OBTAINED BY _____

NOTES: Use of this form is subject to the terms and conditions of the Department of Environmental Protection, Division of Water Resources, and the Department of Environmental Protection, Division of Water Resources, and the Department of Environmental Protection, Division of Water Resources.

850131082

145

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER RESOURCESWELL NO: 2611523-9

Coordinate - : 26.13.7.70

APPLICATION NO. _____
COUNTY EssexWELL RECORD

1. OWNER City of Newark ADDRESS Newark, New Jersey
Owner's Well No. MW-2A SURFACE ELEVATION _____ Feet
Lot: 16 Block: 5001
2. LOCATION _____
3. DATE COMPLETED 9/08/87 DRAILER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 15.0' Feet
5. CASING: Type Stainless Steel Diameter 4 inches Length 5.0' Feet
6. SCREEN: Type " " Size of Opening 0.15 Diameter 4 inches Length 10.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date NONE Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT: NONE
Type _____ Mfg. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ P.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring Purposes AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Samples 1 Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Any samples available? _____
(See reverse or back of sheet or on separate sheet. If sample log and pump, please furnish both.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Walter Kottner #1316 Date October 9, 1987

NOTE: The owner of this well is responsible for the maintenance of this well and for the safety of the well. The user of this well is responsible for the safety of the well and for the safety of the user.

850131083

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269072

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 12 Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/7/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 20 Feet
5. CASING: Type PVC Diameter 4 inches Length 5 Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 15 Feet
Range in Depth { Top 15 Feet
Bottom 20 Feet } Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electronic log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131084

APPENDIX N

Waste Characterization Analytical Data and Hazardous Waste Disposal Manifests.



LABORATORY RESOURCES, INC.

INTECH BIOLABS DIVISION

158 Tices Lane East Brunswick, New Jersey 08816 (908) 257-1050 Fax (908) 257-2790

Intech Analytical Report No. I104055
ROUX ASSOCIATES

ANALYTICAL RESULTS: POLYCHLORINATED BIPHENYLS

Intech Sample Number: 01
Client Designation: WC-1

| | | | |
|--------------|-------------|--------------|----------|
| Prep Factor: | 30.0 | 10.0 | 1,000 |
| | ----- | ----- | ----- |
| | Sample Size | Final Volume | Dilution |

| Parameter | Results
(ug/kg) | Detection
Limits
(ug/kg) |
|--------------|--------------------|--------------------------------|
| ----- | ----- | ----- |
| Aroclor 1016 | ND | 19,000 |
| Aroclor 1221 | ND | 19,000 |
| Aroclor 1232 | ND | 19,000 |
| Aroclor 1242 | ND | 19,000 |
| Aroclor 1248 | 200,000 | 19,000 |
| Aroclor 1254 | ND | 19,000 |
| Aroclor 1260 | ND | 19,000 |

850131086



LABORATORY RESOURCES, INC.

INTECH BIOLABS DIVISION

158 Tices Lane East Brunswick, New Jersey 08816 (908) 257-1050 Fax (908) 257-2790

Intech Analytical Report No. I104055
ROUX ASSOCIATES

ANALYTICAL RESULTS: TOXICITY CHARACTERISTIC LEACHATE PROCEDURE
Intech Sample Number: 01
Client Designation: WC-1
Bias Adjustment Sample: 01 (VOA), 3259-04 (Semi), 3260 (Pest),
3260-12 (Herb), 3259-01 (Met)

| Parameter | Results
(Unadjusted)
(ug/L) | Results
(Adjusted)
(ug/L) | Regulatory
Limits
(ug/L) |
|-----------------------|-----------------------------------|---------------------------------|--------------------------------|
| Vinyl chloride | < 50 | < 72 | 200 |
| 1,1-Dichloroethene | < 50 | < 63 | 700 |
| Chloroform | < 50 | < 60 | 6,000 |
| 1,2-Dichloroethane | < 50 | < 57 | 500 |
| Carbon tetrachloride | < 50 | < 63 | 500 |
| Trichloroethene | < 50 | < 60 | 500 |
| Benzene | < 50 | < 58 | 500 |
| 2-Butanone | < 50 | < 64 | 200,000 |
| Tetrachloroethene | < 50 | < 60 | 700 |
| Chlorobenzene | < 50 | < 56 | 100,000 |
| Pyridine | < 25 | < 29 | 5,000 |
| 1,4-Dichlorobenzene | < 25 | < 29 | 7,500 |
| Hexachloroethane | < 25 | < 29 | 3,000 |
| 2-Methylphenol | < 25 | < 36 | 200,000 |
| 3- and 4-Methylphenol | < 25 | < 36 | 200,000 |
| Nitrobenzene | < 25 | < 30 | 2,000 |
| Hexachlorobutadiene | < 25 | < 30 | 500 |
| 2,4,6-Trichlorophenol | < 25 | < 32 | 2,000 |
| 2,4,5-Trichlorophenol | < 25 | < 32 | 400,000 |
| 2,4-Dinitrotoluene | < 25 | < 32 | 130 |
| Hexachlorobenzene | < 25 | < 48 | 130 |
| Pentachlorophenol | < 130 | < 180 | 100,000 |
| Lindane | < 1.0 | < 0.94 | 400 |
| Heptachlor | < 0.8 | < 0.74 | 8 |
| Heptachlor epoxide | < 2.0 | < 1.9 | 8 |
| Endrin | < 1.0 | < 1.8 | 20 |
| Chlordane | < 1.0 | < 0.8 | 30 |
| Toxaphene | < 5.0 | < 5.1 | 500 |
| Methoxychlor | < 8.0 | < 8.2 | 10,000 |
| 2,4-D | < 5.0 | < 7.5 | 10,000 |
| 2,4,5-TP (Silvex) | < 2.5 | < 2.0 | 1,000 |
| Arsenic | < 50 | < 50 | 5,000 |
| Barium | 590 | 570 | 100,000 |
| Cadmium | < 50 | < 43 | 1,000 |
| Chromium | 330 | 310 | 5,000 |
| Lead | < 200 | < 200 | 5,000 |
| Mercury | < 25 | < 22 | 200 |
| Selenium | < 50 | < 45 | 1,000 |
| Silver | 61 | 59 | 5,000 |

850131087



LABORATORY RESOURCES, INC.

INTECH BIOLABS DIVISION

158 Tices Lane East Brunswick, New Jersey 08816 (908) 257-1050 Fax (908) 257-2730

Intech Analytical Report No. I104055
ROUX ASSOCIATES

ANALYTICAL RESULTS: GENERAL CHEMISTRY

Intech Sample Number: 01
Client Designation: WC-1

| Parameter | Results
(mg/L) | Detection
Limits
(mg/L) |
|----------------------------------------------|-------------------|-------------------------------|
| Hydrogen Ion (pH), units | 7.2 | --- |
| Ignitability, °F | 130 | --- |
| Petroleum Hydrocarbons,
Total Recoverable | 1,400 | 21 |
| Reactive Cyanide | ND | 0.98 |
| Reactive Sulfide | ND | 17 |
| Paint Filter, % | ND | 5 |
| Total Solids, % | 88 | --- |

850131088

Reliance Laboratories Inc.

3090 Woodbridge Avenue
Edison, NJ 08837
(201) 738-5454

FAX # - (201) 738-5841

DISPOSAL

SAMPLING

TCLP METALS
RESULTS

TELECOPIER COVER SHEET

DATE: 2 February 1991

ATTENTION: Mr. J. Powley

FROM: G. P. Korpelani

NUMBER OF PAGES INCLUDING COVER SHEET: 3

PLEASE CALL US IF THERE WAS A PROBLEM EXPERIENCED WITH THIS
TRANSMISSION.

THANK YOU.

850131089

Reliance Laboratories Inc.

3090 Woodbridge Avenue
Edison, NJ 08837
Ph. (201) 738-5454 Fax: (201) 738-5841

LAB ID 12687

CERTIFICATE OF ANALYSIS

Customer : Roux Associates Inc.
Sample : Soil # 1 Monsanto Kearny Plant
Date : 29 January 1991
Reference: K-1318

Attention : Mr. J. Powley

2 February 1991

TCLP MetalsResult, ppm

| | |
|----------|-----------|
| Arsenic | Trace < 1 |
| Barium | * ND < 1 |
| Cadmium | Trace < 1 |
| Chromium | ND < 1 |
| Lead | ND < 1 |
| Mercury | ND < 0.05 |
| Selenium | Trace < 1 |
| Silver | ND < 1 |

* ND = Not Detected



G. P. Kirpalani
Manager

850131090

Reliance Laboratories Inc.

3090 Woodbridge Avenue
Edison, NJ 08837
Ph. (201) 738-5454 Fax: (201) 738-5841

LAB ID 12687

CERTIFICATE OF ANALYSIS


Customer : Roux Associates Inc.
Sample : Soil # 2 Monsanto Kearny Plant
Date : 29 January 1991
Reference: K-1319

2 February 1991

Attention : Mr.J.Powley

| <u>TCLP Metals</u> | <u>Result, ppm</u> |
|--------------------|--------------------|
| Arsenic | * ND < 1 |
| Barium | ND < 1 |
| Cadmium | Trace < 1 |
| Chromium | ND < 1 |
| Lead | ND < 1 |
| Mercury | ND < 0.05 |
| Selenium | Trace < 1 |
| Silver | ND < 1 |

* ND = Not Detected


G. P. Kirpalani
Manager

850131091



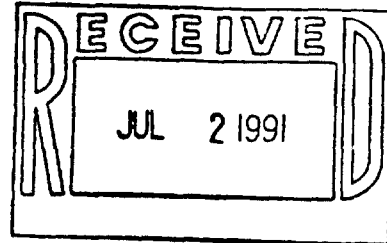
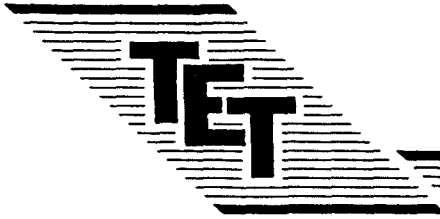
State of New Jersey
Department of Environmental Protection
Division of Hazardous Waste Management
Manifest Section
CN 028, Trenton, NJ 08625

850131092

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 2-83.

| | | | | | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------|--|--------------------------------------|--|----------------------------------------------|--|----------------------------------------------------------------|--|----------------------------|--|---------------|--|
| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No.
NJ 000 0 0 2 4 4 4 9 3 3 0 4 6 0 1 2 | | Manifest Document No.
0 4 6 0 1 2 | | 2. Page 1 of 1 | | Information in the shaded area is not required by Federal law. | | | | | |
| 3. Generator's Name and Mailing Address
Monsanto Chemical Company
Foot Of Pennsylvania Avenue
Kearny, New Jersey 07032
Generator's Phone (201) 589-0350 | | | | | | 24 Hour Emergency Contact: Guard | | | | | | | |
| 4. Generator's Phone (201) 589-0350 | | | | | | (201) 589-0350 | | | | | | | |
| 5. Transporter 1 Company Name
Rollins Environmental Services | | | | | | 6. US EPA ID Number
NJ 005 3 2 8 8 2 3 9 | | | | | | | |
| 7. Transporter 2 Company Name | | | | | | 8. US EPA ID Number | | | | | | | |
| 9. Designated Facility Name and Site Address
Rollins Environmental Services
Route 322 and I-295
Bridgeport, New Jersey 08614 | | | | | | 10. US EPA ID Number
NJ 005 3 2 8 8 2 3 9 | | | | | | | |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)
HM | | | | | | 12. Containers
No. Type | | 13. Total Quantity | | 14. Unit
Vol/Vol | | 15. Waste No. | |
| a. <input checked="" type="checkbox"/> Non-Hazardous Solid and Sludge, N.O.S. | | | | | | 20 DM | | 10886 | | P | | C 1 8 4 | |
| b. <input checked="" type="checkbox"/> Non-Hazardous Liquid, N.O.S. | | | | | | 10 DM | | 4355 | | P | | C 1 7 0 | |
| c. | | | | | | | | | | CP | | | |
| d. | | | | | | | | | | | | | |
| J. Additional Descriptions for Materials Listed Above
NJ Special Waste C184 Sand SI ROLLINS DRILL CUTTINGS T/F 3
a. Chromium and Compounds, N.O.S. L# 32563 99% SOIL <1% CHROMIUM AND CHROMIUM
NJ Special Waste C170 ROLLINS WELL DEVELOPMENT WATER 99% WATER
b. Chlorobenzene, LIQ L# 32862 DRILLING FLUIDS T/F 1 1/2 GALLONS | | | | | | K. Handling Codes for Wastes Listed Above | | | | | | | |
| 15. Special Handling Instructions and Additional Information.
Use protective equipment and clothing. If contact with eyes or skin, flush with plenty of water for at least 15 mins. Call physician. 24 Hrs. emergency contact CHEMTREC 1-800-424-9300 | | | | | | | | | | | | | |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. | | | | | | | | | | | | | |
| Printed/Typed Name
Constantino J. Barrial | | | | | | Signature
Constantino Barrial | | Month Day Year
10 10 79 | | | | | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | | | | | Printed/Typed Name
CARY HILL | | Signature
Cary Hill | | Month Day Year
10 10 79 | | | |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | | | | | Printed/Typed Name | | Signature | | Month Day Year | | | |
| 19. Discrepancy Indication
Space DI # 08193 Item 21
Immediate | | | | | | | | | | | | | |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. | | | | | | Printed/Typed Name
J. Barrial | | Signature
J. Barrial | | Month Day Year
10 10 79 | | | |



*Pat
Walt*

TIPTON ENVIRONMENTAL TECHNOLOGY INC

P.O. Box 849, Hwy. 50 East, Tipton, MO 65081 (816) 433-5585 Fax (816) 433-2261

June 25, 1991

Celso Balan

Monsanto Chemical Company
Foot of Pennsylvania Avenue
Kearny, NJ 07032

Dear Celso Balan:

Attached, please find your Certificate of Disposal for material sent to us on Manifest #0660A, dated February 22, 1991. This will complete the disposal of all items listed on this manifest.

For your convenience in following our tracking system I have "hi-lighted" all information pertaining to your load.

If you have any questions, please feel free to contact me at, (816) 433-5585.

Sincerely,

Ellen Bestgen
Ellen Bestgen

ENCL.

CC: Roux Association Inc.

850131093

850131094

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087



L. E. I., INC.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved OMB No. 2050-0039, expires 09-

| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of 1 | Information in the shaded area is not required by Federal law | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------|---------------------------------------------------------|---------------------------------------------------------------|-------------------------|
| 3. Generator's Name and Mailing Address
Tipton Environmental Technology, Inc.
1 Mile East, HWY 50
Tipton, MO 65081 | | 4. Generator's Phone (816) 433-5585 (24 hour emergency number) | | A. State Manifest Document Number
No 00266285 | | |
| 5. Transporter 1 Company Name
Custom Environmental Transport | | 6. US EPA ID Number
D E D 9 8 0 9 1 8 R 5 8 | | B. State Generator's ID
99929 | | |
| 7. Transporter 2 Company Name | | 8. US EPA ID Number | | C. State Transporter's ID
40756 | | |
| 9. Designated Facility Name and Site Address
Rollins Environmental Services (TX), Inc.
2027 Battleground Road
Deer Park, TX 77536 | | 10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8 | | D. Transporter's Phone
713-930-4504 | | |
| | | | | E. State Transporter's ID | | |
| | | | | F. Transporter's Phone | | |
| | | | | G. State Facility's ID
50089 | | |
| | | | | H. Facility's Phone
713-930-2300 | | |
| 11A. HM | 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | 1. Waste No. |
| a. | RQ Hazardous Substance Liquid NOS
ORM-E NA 9188 (PCBs) | 7 | 4 DM | 12082.5 | K | M008 PCB1
173880 |
| b. | RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | 3 | DM | 1.685 | K | M012 PCB2
178570 |
| c. | | | | | | |
| d. | | | | | | |
| J. Additional Descriptions for Materials Listed Above
11A. HO-43593-39 (PCB Caps & Ballasts)
11B. HO-43626-48 (Empty PCB Drums In OP) | | | | K. Handling Codes for Wastes Listed Above
T07 | | |
| 15. Special Handling Instructions and Additional Information
PCB MANIFEST
For Additional Required Information See Attached Continuation Sheet | | | | | | |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. | | | | | | |
| Printed/Typed Name
James S. Sidebottom | | Signature
<i>James S. Sidebottom</i> | | Month Day Year
02 27 91 | | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | Printed/Typed Name
THEEN GREEN | | Signature
<i>Green</i> | | Date
02 27 91 |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | Printed/Typed Name | | Signature | | Date |
| 19. Discrepancy Indication Space | | | | | | |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19. | | | | | | |
| Printed/Typed Name
Rollins Environmental Services | | Signature
<i>Rollins</i> | | Date
02 27 91 | | |

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 2 of 7MANIFEST # 91024/20628

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE
EPA WASTE |
|---------------------------|------------|-----------------------------------|-------------------------------------------------|---------------------|-------|----------|--------|-----------------------|
| Orlando
Utilities | 33 | 459 | 11-30-90 | Drummed
PCB Caps | 98 | 43593-39 | 173880 | PCB-1
M008 |
| US West
Communications | 47 | USW-01-91 | 9-20-90 | | 288.5 | | | |
| | | USW-02-91 | 12-13-90 | | 178 | | | |
| | | USW-03-91 | 1-2-91 | | 276.5 | | | |
| | | USW-04-91 | ↓ | | 316 | | | |
| ↓ | ↓ | USW-05-91 | 9-4-90 | | 178.5 | | | |
| PPM-PA | 30 | 4939 | 10-10-90 | | 134.5 | | | |
| | | 6040 | 11-26-90 | | 305 | | | |
| | | 52 | 1-3-91 | | 150.5 | | | |
| | | 112 | 1-2-91 | | 143 | | | |
| | | 115 | | | 166.5 | | | |
| | | 116 | | | 68 | | | |
| | | 113 | ↓ | | 137 | | | |
| | | 4938 | 10-10-90 | | 61 | | | |
| | | 4479 | 8-3-90 | | 54 | | | |
| | | 114 | 1-2-91 | | 167.5 | | | |
| ↓ | ↓ | 5798 | 8-6-90 | ↓ | 106 | ↓ | ↓ | ↓ |

TOTAL KG

2830.5

850131095

n 11

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 3 of 7

MANIFEST # 91024/20628

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE #
EPA WASTE # |
|-----------|------------|-----------------------------------|-------------------------------------------------|---------------------|-------|----------|--------|---------------------------|
| PPM-PA | 30 | 5902 | 12-14-90 | Drummed
PCB CAPS | 135.5 | 43593-39 | 173880 | PCB-1
m008 |
| | | 5096 | 9-10-90 | | 118.5 | | | |
| | | 4937 | 9-25-90 | | 207.5 | | | |
| | | 5903 | 12-14-90 | | 134 | | | |
| | | 5275 | 11-9-90 | | 183 | | | |
| | | 5276 | | | 119 | | | |
| | | 5277 | ↓ | | 184 | | | |
| | | 4891 | 7-20-90 | | 148 | | | |
| | | 5430 | 7-10-90 | | 150 | | | |
| | | 5117 | 10-15-90 | | 119 | | | |
| | | 5118 | ↓ | | 157 | | | |
| | | 5904 | 11-26-90 | | 133 | | | |
| | | 5122 | 10-15-90 | | 146.5 | | | |
| | | 4893 | 9-1-90 | | 80 | | | |
| | | 4489 | 9-2-90 | | 147 | | | |
| | | 4892 | 9-1-90 | | 134 | | | |
| ↓ | ↓ | 5120 | 10-15-90 | ↓ | 149 | ↓ | ↓ | ↓ |

TOTAL KG

2445 Kgs

850131096

00

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 4 of 7

MANIFEST # 91024 / 2662

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE
EPA WASTE |
|-----------|------------|-----------------------------------|-------------------------------------------------|---------------------|----------|----------|--------|-----------------------|
| PPM-PA | 30 | 5095 | 9-10-90 | Drummed
PCB Caps | 109 | 43593-39 | 173880 | PCB-1
MO08 |
| | | 4890 | 6-1-90 | | 135.5 | | | |
| | ↓ | 5119 | 10-15-90 | | 123 | | | |
| | 48 | 357 | 1-7-91 | | 196 | | | |
| | | 358 | | | 140.5 | | | |
| | | 361 | | | 102.5 | | | |
| | | 362 | | | 103.5 | | | |
| | | 363 | | | 147.5 | | | |
| | | 374 | ↓ | | 102 | | | |
| | | 393 | 8-28-90 | | 150.5 | | | |
| | | 394 | ↓ | | 141.5 | | | |
| | | 395 | ↓ | | 143 | | | |
| | | 443 | 1-22-91 | ↓ | 213.5 | | | |
| | | 637 | 10-30-90 | BALLASTS | 362.5 | | | |
| | | 638 | | | 366 | | | |
| | | 639 | | | 193 | | | |
| ↓ | ↓ | 640 | ↓ | ↓ | 234.5 | ↓ | ↓ | ↓ |
| TOTAL KG | | | | | 2964 Kgs | | | |

850131097

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 5 of 7

MANIFEST # 91024/26426

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE :
EPA WASTE : |
|-----------|------------|-----------------------------------|-------------------------------------------------|-------------------------|-------|----------|--------|---------------------------|
| PPM-PA | 48 | 641 | 10-30-90 | Drummed
Ballasts PCB | 356.5 | 43593-39 | 173886 | PCB-1
MOOR |
| | | 1024 | 2-11-91 | Caps | 197 | | | |
| | | 1025 | | | 198 | | | |
| | | 1026 | | | 197.5 | | | |
| | | 1027 | | | 204 | | | |
| | | 1028 | | | 131.5 | | | |
| | | 1029 | | | 195 | | | |
| | | 1030 | | | 195.5 | | | |
| | | 1031 | | | 199 | | | |
| | | 1032 | | | 119.5 | | | |
| | | 1033 | | | 131.5 | | | |
| | | 1034 | ↓ | | 120 | | | |
| | | 1197 | 2-15-91 | | 186.5 | | | |
| | | 1198 | ↓ | | 167.5 | | | |
| | | 1199 | ↓ | | 179 | | | |
| | | 5121 | 10-15-90 | | 187 | | | |
| ✓ | ✓ | 5123 | ↓ | ✓ ✓ | 56 | ✓ | ✓ | ✓ |

TOTAL KG

3021 Kgs

850131098

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 6 of 7

MANIFEST # 91024/26628

[illegible]

850131099

TOTAL KG

822 Kg

21

CONTINUATION SHEET FOR LIQUID SHIPMENTS

So I did

Page 7 of 7

MANIFEST # 91024/26628

[illegible]

TOTAL KG

168.5 Kgs

850131100

PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC

RUN DATE : 5/08/91

CERTIFICATE OF DESTRUCTION

RUN TIME : 2:08 PM

PAGE: 1

Certificate of Destruction Stream Bill of Invoice Manifest Received Final
Name and Address Number Lading Pounds Number Date Destruct

043626 125402 493 TX00393478 02/28/91 04/25/91
TX00266285

TIPTON ENVIRONMENTAL TECH. INC
P.O. BOX 849
1 MILE E HWY 50
TIPTON MO 65081
Attn: STEVE SIDEBOTTOM

T. E. T., INC.
MAY 13 1991
TIPTON, MO

| Inventory
Cntrl Nbr | Customer's Unique
Serial Number | -----
Type | CONTAINER
Pounds | -----
Contents | Suff SHP
Code | Destroyed
TO Mthd Date |
|------------------------|------------------------------------|---------------|---------------------|-------------------|------------------|---------------------------|
| 001711442 | 14 | 55SD | 126 | DEBRIS | 48 | I 04/25/91 |
| 001711443 | 6 | 55SD | 122 | DEBRIS | 48 | I 04/25/91 |
| 001711444 | 13 | 55SD | 122 | DEBRIS | 48 | I 04/25/91 |
| 001711445 | 4629 | 55SD | 122 | DEBRIS | 48 | I 04/25/91 |
| Total Containers : | | 4 | 492 | | | |

850131101


PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC
RUN DATE : 5/08/91 CERTIFICATE OF DESTRUCTION
RUN TIME : 2:08 PM

PAGE: 2

* Disposal Methods : *
* 'I' - Waste that was incinerated. *
* 'L' - Waste that was landfilled. *
* Disposal Facility : ROLLINS ENVIRONMENTAL SERVICES (TX) INC *
* (Incinerated Waste) PO BOX 609 *
* DEER PARK TX 77536 *
* EPA ID: TXD055141378 *

Under civil and criminal penalties of law for making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Please call (713) 930-2317 if there are any questions concerning the information on this Certificate of Destruction.



Authorized Agent
ROLLINS ENVIRONMENTAL SERVICES (TX) INC

850131102

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087



Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0039, expires 09-

| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No.
M O D 9 8 1 5 0 6 6 1 1 | Manifest Document No.
9 1 0 4 5 | 2. Page 1 of 4 | Information in the shaded area is not required by Federal law | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------|----------------|
| 3. Generator's Name and Mailing Address
Tipton Environmental Technology, Inc.
1 Mile East HWY 50, Tipton, MO 65081
ATTN: Steve XSteve Sidebottom | | | | A. State Manifest Document Number
N ^o 00393455 | | |
| 4. Generator's Phone
816 433-5585 (24 hour emergency number) | | | | B. State Generator's ID
99929 | | |
| 5. Transporter 1 Company Name
Custom Environmental Transport | | | | C. State Transporter's ID
40756 | | |
| 6. US EPA ID Number
M O D 9 8 0 9 1 8 8 5 8 | | | | D. Transporter's Phone
713-930-4500 | | |
| 7. Transporter 2 Company Name | | | | E. State Transporter's ID | | |
| 8. US EPA ID Number | | | | F. Transporter's Phone | | |
| 9. Designated Facility Name and Site Address
Rollins Environmental Service (TX), Inc.
2027 Battleground Road
Deer Park, TX 77536 | | | | G. State Facility's ID
850089 | | |
| 10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8 | | | | H. Facility's Phone
713-930-2300 | | |
| 11A. HM | 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt./Vol | 1. Waste No. |
| | a. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | 29 | DM | 4362 | K | M009
179430 |
| | b. RQ Hazardous Substance Liquid NOS
ORM-E NA 9188 (PCBS) | 10 | DM | 2721.5 | K | M009
118870 |
| | c. | | | | | |
| | d. | | | | | |
| J. Additional Descriptions for Materials Listed Above
11A. HO-43624-48 PCB Detritus Debris
11B. HO-43598-47 PCB Drummed Sludge | | | | K. Handling Codes for Wastes Listed Above
11A. PCB-2
11B. PCB-2 | | |
| 15. Special Handling Instructions and Additional Information
PCB MANIFEST
SEE ATTACHED CONTINUATION SHEET FOR ADDITIONAL INFORMATION | | | | | | |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and selected the best waste management method that is available to me and that I can afford. | | | | | | |
| Printed/Typed Name
James S. Sidebottom | | Signature
James S. Sidebottom | | | Month Day Year
03/22/99 | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | Signature
Ronald E. Dempsey | | | Date
03/22/99 | |
| Printed/Typed Name
Ronald E. Dempsey | | Signature
Ronald E. Dempsey | | | Month Day Year
03/22/99 | |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | Signature | | | Date | |
| Printed/Typed Name | | Signature | | | Month Day Year | |
| 19. Discrepancy Indication Space | | | | | | |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
RES (TX) Inc. | | | | | | |
| Printed/Typed Name
John Mojica Jr. | | Signature
John Mojica Jr. | | | Date
03/22/99 | |

CONTINUATION SHEET FOR ~~LIQUID~~ SOLID WASTE
Solid

Page 2 of 4

MANIFEST # 91045/39345

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE
EPA WASTE |
|-------------------------|------------|-----------------------------------|-------------------------------------------------|-----------------------|-------|----------|--------|-----------------------|
| Montana
Dakota | 66 | SW12180 | 1-4-91 | Drummed
PCB Debris | 46.5 | 43624-48 | 179430 | PCB-2
MOOS |
| | | SW12181 | ↓ | | 77 | | | |
| | | SW161248 | 11-2-90 | | 62.5 | | | |
| | | SW161247 | 10-19-90 | | 83.5 | | | |
| | | SW161245 | 11-21-90 | | 74.5 | | | |
| | | SW161250 | 1-22-91 | | 80 | | | |
| | | SW161243 | 8-22-90 | | 81 | | | |
| | | SW161251 | 2-22-91 | | 84.5 | | | |
| | | SW161246 | 11-30-90 | | 81.5 | | | |
| ↓ | ↓ | SW161249 | 10-19-90 | | 66.5 | | | |
| Monsanto
Chemical Co | 49 | 08 | 10-2-90 | (85) | 204.5 | | | |
| | | 09 | | (85) | 285.5 | | | |
| | | 01 | | (85) | 118.5 | | | |
| | | 04 | | (85) | 221 | | | |
| | | 11 | | (85) | 216 | | | |
| | | 10 | | (85) | 269.5 | | | |
| ↓ | ↓ | 05 | ↓ | (85) | 394.5 | ↓ | ↓ | ↓ |
| TOTAL KG | | | | | 2447 | | | |

850131104

Ann S. Siddons 3-22-91

age 2 c 4
MANIFEST # 91045/3934

TOTAL KG 1915

James S. Delotto 3-22-91

age 1 (4)
MANIFEST # 91045/39345:

TOTAL KG 2721.5

James S. Lidbotten 3-22-91

850131107

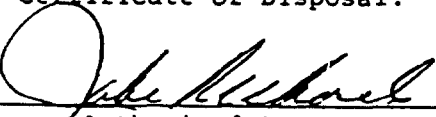
PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC
RUN DATE : 6/20/91 CERTIFICATE OF DISPOSAL
RUN TIME : 11:02 AM

PAGE: 2

* Disposal Methods : *
* 'I' - Waste that was incinerated. *
* 'L' - Waste that was landfilled. *
* Disposal Facility : ROLLINS ENVIRONMENTAL SERVICES (TX) INC *
* (Incinerated Waste) PO BOX 609 *
* DEER PARK TX 77536 *
* EPA ID: TXD055141378 *
*

Under civil and criminal penalties of law for making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Please call (713) 930-2317 if there are any questions concerning the information on this Certificate of Disposal.



Authorized Agent
ROLLINS ENVIRONMENTAL SERVICES (TX) INC

850131108

PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC
 RUN DATE : 6/20/91 CERTIFICATE OF DISPOSAL
 RUN TIME : 11:02 AM

PAGE: 1

 Certificate of Disposal Stream Bill of Invoice Manifest Received Final
 Name and Address Number Lading Pounds Number Date Disposal

 043624 126390 9,612 TX00393455 04/02/91 06/17/91

1 1 1 110

TIPTON ENVIRONMENTAL TECH. INC
 P.O. BOX 849
 1 MILE E HWY 50
 TIPTON MO 65081
 Attn: STEVE SIDEBOTTOM

TIPTON, MO

| Inventory
Cntrl Nbr | Customer's Unique
Serial Number | ----- CONTAINER -----
Type Pounds Contents | Suff SHP
Code TO Mthd | Disposal
Date |
|------------------------|------------------------------------|-----------------------------------------------|--------------------------|------------------|
| 001777318 | SW161246 | 55SD 190 DEBRIS | 48 | I 04/07/91 |
| 001777319 | TET-14 | 55SD 196 DEBRIS | 48 | I 04/07/91 |
| 001777320 | PDB9104502 | 55SD 126 DEBRIS | 48 | I 04/07/91 |
| 001777321 | TET-18 | 55SD 128 DEBRIS | 48 | I 04/07/91 |
| 001777322 | 15 | 55SD 346 DEBRIS | 48 | I 04/07/91 |
| 001777323 | 16 | 55SD 354 DEBRIS | 48 | I 04/07/91 |
| 001777324 | 17 | 55SD 360 DEBRIS | 48 | I 04/07/91 |
| 001777325 | SW161248 | 55SD 130 DEBRIS | 48 | I 04/08/91 |
| 001777326 | TET-15 | 55SD 128 DEBRIS | 48 | I 04/07/91 |
| 001777327 | TET-17 | 55SD 108 DEBRIS | 48 | I 04/07/91 |
| 001777328 | SW12180 | 55SD 108 DEBRIS | 48 | I 04/07/91 |
| 001777329 | SW161249 | 55SD 150 DEBRIS | 48 | I 04/07/91 |
| 001777330 | TET-16 | 55SD 146 DEBRIS | 48 | I 04/07/91 |
| 001777331 | SW161245 | 55SD 170 DEBRIS | 48 | I 04/07/91 |
| 001777332 | SW12181 | 55SD 162 DEBRIS | 48 | I 04/07/91 |
| 001777333 | SW161243 | 55SD 180 DEBRIS | 48 | I 04/07/91 |
| 001777334 | SW161247 | 55SD 182 DEBRIS | 48 | I 04/07/91 |
| 001777335 | SW161250 | 55SD 180 DEBRIS | 48 | I 04/08/91 |
| 001777336 | SW161251 | 55SD 182 DEBRIS | 48 | I 04/08/91 |
| 001777337 | 04 | 85SD 460 DEBRIS | 48 | I 04/08/91 |
| 001777338 | 08 | 85SD 470 DEBRIS | 48 | I 04/08/91 |
| 001777339 | 01 | 85SD 450 DEBRIS | 48 | I 04/08/91 |
| 001777340 | 09 | 85SD 446 DEBRIS | 48 | I 04/08/91 |
| 001777341 | 03 | 85SD 782 DEBRIS | 48 | I 04/08/91 |
| 001777342 | 02 | 85SD 790 DEBRIS | 48 | I 04/08/91 |
| 001777343 | 12 | 85SD 675 DEBRIS | 48 | I 04/08/91 |
| 001777344 | 10 | 85SD 679 DEBRIS | 48 | I 06/17/91 |
| 001777345 | 05 | 85SD 680 DEBRIS | 48 | I 06/17/91 |
| 001777346 | 11 | 85SD 680 DEBRIS | 48 | I 04/08/91 |

Total Containers : 29 9,638

850131109

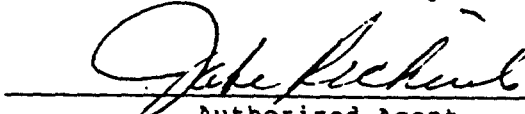
PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC
RUN DATE : 6/20/91 CERTIFICATE OF DISPOSAL
RUN TIME : 11:02 AM

PAGE: 2

* Disposal Methods : *
* 'I' - Waste that was incinerated. *
* 'L' - Waste that was landfilled. *
* Disposal Facility : ROLLINS ENVIRONMENTAL SERVICES (TX) INC *
* (Incinerated Waste) PO BOX 609 *
* DEER PARK TX 77536 *
* EPA ID: TXD055141378 *
* *

Under civil and criminal penalties of law for making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Please call (713) 930-2317 if there are any questions concerning the information on this Certificate of Disposal.



Authorized Agent
ROLLINS ENVIRONMENTAL SERVICES (TX) INC

850131110

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087



850131111

Please print or type. (Form designed for use on elite (12-pitch) typewriter)

Form approved. OMB No. 2050-0039, expires 09-30

| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No.
M O D 9 8 1 5 0 6 6 1 1 8 1 0 2 5 | Manifest Document No.
2 5 | 2. Page 1 of 6 | Information in the shaded area is not required by Federal law | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------|
| 3. Generator's Name and Mailing Address
Tipton Environmental Technology, Inc.
1 Mile East, Hwy 50, P.O. Box 849
Tipton, MO 65081 | | | | A. State Manifest Document Number
N ^o 00238832 | | |
| 4. Generator's Phone (816) 433-5585 (24 hour emergency number) | | | | B. State Generator's ID
99929 | | |
| 5. Transporter 1 Company Name
Custom Environmental Transport | | | | C. State Transporter's ID
40756 | | |
| 6. US EPA ID Number
D E D 9 8 0 9 1 8 8 5 8 | | | | D. Transporter's Phone
713-930-4500 | | |
| 7. Transporter 2 Company Name | | | | E. State Transporter's ID | | |
| 8. US EPA ID Number | | | | F. Transporter's Phone | | |
| 9. Designated Facility Name and Site Address
Rollins Environmental Services (TX), Inc.
2027 Battleground Road
Deer Park, TX 77536 | | | | G. State Facility's ID
50089 | | |
| 10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8 | | | | H. Facility's Phone
713-930-2300 | | |
| 11A. HM | 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | 1. Waste No. |
| | a. RQ Hazardous Substance Liquid NOS
ORM-E NA 9188 (PCBs) | 2 | D M | 210 | K | M009
118870 |
| | b. RQ Hazardous Substance Liquid NOS
ORM-E NA 9188 (PCBs) | 2 | D M | 253.5 | K | M011
110550 MKM |
| | c. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | 2 | D M | 372 | K | M009
179430 |
| | d. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | 19
18 | D M | 1440
1135.5 | K | M009
179430 put this in 11009 |
| J. Additional Descriptions for Materials Listed Above
11A. HO-43598-47 (PCB Sludge) 11D. HO-43624-48 (PCB Debris)
11B. HO-43597-46 (PCB Water)
11C. HO-44107-48 (PCB Carbon) | | | | K. Handling Codes for Wastes Listed Above
ACD - TU7
B - TU6 | | |
| 15. Special Handling Instructions and Additional Information
PCB Manifest
See Attached Continuation Sheet For Additional Information. | | | | 11A. PCB2
11B. PCB2
11C. PCB2
11D. PCB2 | | |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. | | | | | | |
| Printed/Typed Name
James S. Sidebottom | | | Signature
<i>James S. Sidebottom</i> | | Month Day Year
0 2 2 7 9 9 | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | | | | Date | |
| Printed/Typed Name
Treen Green | | | Signature
<i>Treen Green</i> | | Month Day Year
0 2 2 7 9 9 | |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | | | | Date | |
| Printed/Typed Name | | | Signature | | Month Day Year | |
| 19. Discrepancy Indication Space | | | | | | |
| 20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19. | | | | | | |
| Printed/Typed Name
Basil P. ... | | | Signature
<i>Basil P. ...</i> | | Month Day Year
12 28 99 | |

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 2 of 6

MANIFEST # 91025 / 238832

[illegible]

850131112

TOTAL KG

210 Kgs

1000...

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page: 3 of 6

MANIFEST # 91025/238832

[illegible]

TOTAL KG

253.5

850131113

100

CONTINUATION SHEET FOR LIQUID SHIPMENTS

Page 4 of 6

MANIFEST # 91025/238832

[illegible]

850131114

TOTAL KG

372 Kgs

1. *Ph...*

CONTINUATION SHEET FOR LIQUID SHIPMENTS
Solid

Page 5 of 6

MANIFEST # 91025/238832

| GENERATOR | WORK ORDER | Generators
Unique ID
Number | Date of Removal
From Storage
For Disposal | DESCRIPTION | KG | HO# | TX# | MO WASTE :
EPA WASTE : |
|---------------------------------------------------|------------|-----------------------------------|-------------------------------------------------|-----------------------|------------|----------|--------|---------------------------|
| Great Lakes
Environmental
Mo And
Service | 27 | 56150 | 1-14-91 | Drummed
PCB Debris | 40 | 43624-48 | 179430 | PCB-2
M009 |
| | 25 | B-244-A | 10-29-90 | | 80.5 | | | |
| | | B-245-A | 12-14-90 | | 81 | | | |
| | | B-246-A | 12-14-90 | | 148 | | | |
| Indiana
Mitsubishi Power | 23 | 939746 | 12-14-90 | | 46 | | | |
| | | 0312836 | | | 47.5 | | | |
| | | 0511465 | 10-2-90 | | 48 | | | |
| | | 939727 | 10-11-90 | | 50.5 | | | |
| | | 939733 | 10-8-90 | | 52 | | | |
| | | 939734 | 11-9-90 | | 44 | | | |
| PPM-PA | 30 | PPM-1 | 8-6-90 | | 36.5 | | | |
| Orlando
Utilities | 33 | 442 | 10-17-90 | | 144 | | | |
| App. Power | 35 | PS2106
91121 | 1-6-91 | | 43.5 | | | |
| | | PS2106
91120 | | | 79.5 | | | |
| | | PS2106
91122 | | | 34.5 | | | |
| | | PS2120
91133 | | | 44. | | | |
| TET, Inc | 34 | 12 | 2-5-91 | | 60 | | | |
| TOTAL KG | | | | | 1079.5 Kgs | | | |

850131115

1 88

CONTINUATION SHEET FOR ~~LIQUID~~ SHIPMENTS

Sold

Page 6 of 6

MANIFEST # 91025/23883.

[illegible]

850131116

TOTAL KG

360.5 $\frac{1}{55}$

11

PROGRAM-ID: PTR1722 ROLLINS ENVIRONMENTAL SERVICES (TX) INC
RUN DATE : 3/14/91 CERTIFICATE OF DESTRUCTION
RUN TIME : 3:20 PM

PAGE: 1

Certificate of Destruction Stream Bill of Invoice Manifest Received Final
Name and Address Number Lading Pounds Number Date Destruct

043597 125402 775 TX00238832 02/28/91 03/07/91

91025
I. E. T., INC.

TIPTON ENVIRONMENTAL TECH. INC
P.O. BOX 849
1 MILE E HWY 50
TIPTON MO 65081
Attn: STEVE SIDEBOTTOM

MAR 21 1991

TIPTON, MO

| Inventory | Customer's Unique | ----- | CONTAINER | ----- | Suff SHP | Destroyed |
|--------------------|-------------------|-------|-----------|----------|--------------|------------|
| Cntrl Nbr | Serial Number | Type | Pounds | Contents | Code TO Mthd | Date |
| 001711682 | 18 | 55SD | 216 | LIQUID | 46 | I 03/07/91 |
| 001711683 | | 85OP | 562 | LIQUID | 46 | I 03/07/91 |
| Total Containers : | | 2 | 778 | | | |

850131117

850131118

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Waste Management Program
P.O. Box 176 Jefferson City, Missouri 65102
314-751-3176

HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12-pitch) typewriter)

Form Approved OMB No 2050-0039, Expires 9-30-91

| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No.
MOD98150661191041 | Manifest Document No.
1041 | 2. Page
1 of 5 | Information in the shaded areas is required by State law. | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------|-------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|----------------------------|
| 3. Generator's Name and Mailing Address
Tipton Environmental Technology, Inc.
1 Mile East HWY 50
Tipton, MO 65081
ATTN: Steve Sidebottom
816 433-5585 (24 HOUR EMERGENCY NUMBER) | | | | A. Missouri Manifest Document Number
1041 | | |
| 4. Generator's Phone | | | | B. G.S.I. (Gen. Site Address)
same | | |
| 5. Transporter 1 Company Name
Tri-State Motor Transit Co. | | | | C. MO. Trans. ID
H1144 NVTPCB021 | | |
| 6. US EPA ID Number
MOD095038998 | | | | D. Transporter's Phone
800-872-8768 | | |
| 7. Transporter 2 Company Name | | | | E. MO. Trans. ID | | |
| 8. US EPA ID Number | | | | F. Transporter's Phone | | |
| 9. Designated Facility Name and Site Address
US Ecology, Inc.
Highway 95
Beatty, NV 89003 | | | | G. State Facility's ID
LFNV83 | | |
| 10. US EPA ID Number
LNV7330010000 | | | | H. Facility's Phone
702-553-2433 | | |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) | | | | 12. Containers
Number | 13. Total Quantity | 14. Unit Wt/Vol |
| a. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | | | | 1 DM | 436.5 | K |
| b. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | | | | 1 DM | 96 | K |
| c. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | | | | 9 CM | 11213 | K |
| d. RQ Hazardous Substance Solid NOS
ORM-E NA 9188 (PCBs) | | | | 2 CM | 907 | K |
| J. Additional Descriptions for Materials Listed Above | | | | I. Waste No. | | |
| a. 07-004-3349 (AV) PCB OILS | | | | EPA WASTE CODE
N I O I N I E
STATE
M O O 9 | | |
| b. 07-004-3349 (C) PCB TRANS OR + FI W/FD. | | | | EPA WASTE CODE
N I O I N I E
STATE
M O O 7 | | |
| c. 07-004-3349 (C) PCB TRANS OR + FI W/FD. | | | | EPA WASTE CODE
N I O I N I E
STATE
M O O 7 | | |
| d. 07-004-3349 (T) PCB TRANS TANKS OR W/FD | | | | EPA WASTE CODE
N I O I N I E
STATE
M O 1 2 | | |
| 15. Special Handling Instructions and Additional Information
PCB MANIFEST | | | | HANDLING CODE (FACILITY USE ONLY)
INTERIM FINAL COMMENTS | | |
| FOR ADDITIONAL REQUIRED INFORMATION
SEE ATTACHED CONTINUATION SHEET | | | | | | |
| 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.
OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method available to me that I can afford. | | | | | | |
| Printed/Typed Name
James S Sidebottom | | Signature
James S Sidebottom | | Month Day Year
03/19/91 | | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | Printed/Typed Name
Jerry Veith | | Signature
Jerry Veith | | Month Day Year
03/19/91 |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | Printed/Typed Name | | Signature | | Month Day Year |
| 19. Discrepancy Indication Space | | | | | | |
| 20. Designated Facility Owner or Operator Certification of receipt and handling of hazardous materials covered by this manifest except as noted in Item 19. | | | | | | |
| Printed/Typed Name
David Tolbert | | Signature
David Tolbert | | Month Day Year
03/22/91 | | |

CONTINUATION SHEET FOR SOLID: SHIPMENTS

PAGE 2 of 5
MANIFEST # 91041

[illegible]

850131119

TOTAL KG 11213 Kgs

James S. Lick 3-19-

TOTAL KG

850131120

James S. Sillerton, 3-19-9.

CONTINUATION SHEET FOR SOURCE: SUB-ENTRY

PAC- 4 - 5
MANIFEST # 91041

[illegible]

TOTAL KG

436.5

850131121

James S. Sclottor 3-19

CONTINUATION SHEET FOR SOLID: SHIP-THIS

PAGE 5 of 5
MANIFEST # 91041

[illegible]

TOTAL KG

96 K₂S

850131122

Acme S. Lidelott 3-19-



an American Ecology company

DISPOSAL FACILITYCERTIFICATE OF RECEIPT AND DISPOSAL

US Ecology, Inc.
P.O. Box 578
Highway 95, 11 Miles South of
Beatty, NV 89003

EPA Identification No. NVT 330010000

WASTE IDENTIFICATION

Manifest No: 91041

Generator Name: TIPTON ENVIRONMENTAL TECHNOLOGY, INC.

Waste Description: 1 Drum of PCB Spill/Debris
1 PCB Transformer Drum - Category C
9 PCB Transformers - Category C
2 PCB Tanks - Category J

DISPOSAL CERTIFICATION

I HEREBY CERTIFY THAT THE ABOVE-REFERENCED WASTE WAS:

- ☒ Received at the US Ecology, Inc., Beatty, Nevada Facility on 03/22/91.
- ☒ Landfilled at the US Ecology, Inc., Beatty, Nevada Facility on 03/22/91.
- ☐ Stored Pending Shipment for Off-Site Treatment/Incineration.
- ☐ Shipped for Incineration on Manifest No. _____ and Incinerated on: _____
(Certificate of Incineration attached).
- ☐ Stored Pending On-Site Treatment.

Under civil and criminal penalties of law for making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instruction made the verification that this information is true, accurate and complete.

R.L. Moreland
US ECOLOGY, INC.

4-5-91
Date

850131123

850131124

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Division of Environmental Quality
Waste Management Program
P.O. Box 176 Jefferson City, Missouri 65102
314-751-3176

HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on eale (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-91

| | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------|--|---------------------------------------------------------------|--|---------------------------------------------------------------|--|----------------------------------------------------------|--|
| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No
NJD 00244493310660A | | Manifest Document No.
244R-EMERGENCY CONTACT: GUARD | | 2. Page 1 of 2 | | Information in the shaded areas is required by State law | |
| 3. Generator's Name and Mailing Address
Monsanto Chemical Company
Foot of Pennsylvania Ave
Kearny, New Jersey 07032 | | | | | | A. Missouri Manifest Document Number
660A | | | |
| 4. Generator's Phone (201) 589-0350 | | | | | | B. State Generator's ID - other
SAME | | | |
| 5. Transporter 1 Company Name
MATLACK SYSTEMS, INC. | | | | | | 6. US EPA ID Number
DE0981110166 | | | |
| 7. Transporter 2 Company Name
MATLACK Systems, Inc | | | | | | 8. US EPA ID Number
DE0981110166 | | | |
| 9. Designated Facility Name and Site Address
TIPTON ENVIRONMENTAL TECHNOLOGY
P.O. BOX 849 HIGHWAY 50 EAST
TIPTON, MO 65081 | | | | | | 10. US EPA ID Number
MO0981506611 | | | |
| 11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)
RQ HAZARDOUS SUBSTANCE SOLID N.O.S.
ORM-E NA 9188 (POLYCHLORINATED BIPHENYLS) | | | | | | 12. Containers
14 DM | | 13. Total Quantity
3843 | |
| | | | | | | 14. Unit Wt/Vol
3200 K | | 1. Waste No.
MO09 NONE | |
| J. Additional Descriptions for Materials Listed Above
PCB CONTAMINATED SOIL TM-64402-09 PCB SOLIDS + Sludge | | | | | | K. Handling Codes for Wastes Listed Above
S 01 T 03 | | | |
| 15. Special Handling Instructions and Additional Information
1. PCB MANIFEST
2. NEW JERSEY STATE HAZARDOUS WASTE CODE: X751, PCB SOLIDS FROM NON-SPECIFIC SOURCE
3. MISSOURI WASTE CODE: MO09 SEE ATTACHED CONTINUATION SHEET FOR ADDITIONAL INFORMATION | | | | | | | | | |
| 16. GENERATOR'S CERTIFICATION I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment.
OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method available to me that I can afford. | | | | | | | | | |
| Printed/Typed Name
CELSS BALAN | | | | Signature
<i>[Signature]</i> | | | | Month Day Year
02/22/91 | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name
JAMES R. PHERIS | | | | Signature
<i>[Signature]</i> | | | | Date
02/22/91 | |
| 18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
LARRY QUICK | | | | Signature
<i>[Signature]</i> | | | | Date
02/22/91 | |
| 19. Discrepancy Indication Space
13.A) Total Qty incorrect. I.A) No waste code not listed in correct location. JSS 2-25-91
11.A) Liquid added to DOT description | | | | | | | | | |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. | | | | | | | | | |
| Printed/Typed Name
JAMES S Sidebottom | | | | Signature
<i>[Signature]</i> | | | | Date
02/25/91 | |

CONTINUATION SHEET

MANIFEST # 0660A

| Generator Name | Unique ID # | Date of Removal
From Service
For Disposal | Container Type | Container Contents | Weight |
|---------------------------|-------------|-------------------------------------------------|----------------|--------------------|--------|
| MONSANTO CHEMICAL COMPANY | 01 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 02 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 03 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 04 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 05 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 06 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 07 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 08 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 09 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 10 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 11 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 12 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 13 | 10/02/90 | DRUM | SOIL | 500 |
| MONSANTO CHEMICAL COMPANY | 14 | 10/02/90 | DRUM | SOIL | 500 |

850131125

Annual Document Log & Work Order
 Tip Invisital nolo inc.
 One Mile E. Hwy. 50, P.O. Box 849
 Tipton, MO 65081
 EPA#: M00981506611

Generators: Moris Chl Co. (army)
 generators US EPA ID# NJD002444933

01/01/91 to 12/31/91
 Page 102

| Work Order
&
Unique ID | Regulatory
Description | Description | Mnft.
| Date of
RFS for
disposal | Date
Rec'd | Weight
Incoming | Weight
Outgoing | Outgoing
Mnft. # | Transport
Date | Disposer
Name | Disposal
Date |
|------------------------------|---------------------------|-----------------------------|------------|--------------------------------|---------------|--------------------|--------------------|---------------------|-------------------|----------------------------------|------------------|
| 49
07 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 436.5 | 436.5 | 91041 | 03-19-91 | US Ecology; Beatty NV | 03-22-91 |
| 49
08 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 204.5 | 204.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
09 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 285.5 | 285.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
01 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 118.5 | 118.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
06 | PCB Container | DM PCB Debris
Repk MT DM | 0660A | 10-02-90 | 02-25-91 | 308.0 | 55.0 | 91024 | 02-27-91 | Rollins Env Ser
Deer Park, TX | 04-25-91 |
| 49
04 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 221.0 | 221.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
11 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 216.0 | 216.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
10 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 269.5 | 269.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
05 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 394.5 | 394.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
02 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 341.0 | 341.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
14 | PCB Container | DM PCB Debris
Repk MT DM | 0660A | 10-02-90 | 02-25-91 | 142.0 | 57.5 | 91024 | 02-27-91 | Rollins Env Ser
Deer Park, TX | 04-25-91 |
| 49
12 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 344.0 | 344.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
03 | PCB Container | DM PCB Debris | 0660A | 10-02-90 | 02-25-91 | 369.0 | 369.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
13 | PCB Container | DM PCB Debris
Repk MT DM | 0660A | 10-02-90 | 02-25-91 | 193.0 | 56.0 | 91024 | 02-27-91 | Rollins Env Ser (TX) | 04-25-91 |
| TOTAL | | | | | | 3843.0 | 3368.5 | | | | |

850131126

Tipton Environmental Technology, Inc.
 One West E. Hwy. 50, P.O. Box 849
 Tipton, MO 65081
 EPA#: MO0981506611

Generator: Monsanto Chemical Co. (Hann)
 Generator's US EPA ID# NJ000244933

01/01/91 to 12/31/91
 Page 203

| Work Order
&
Unique ID | Regulatory
Description | Description | Mnft.
| Date of
RFS for
disposal | Date
Rec'd | Weight
Incoming Outgoing | Outgoing
Mnft. # | Transport
Date | Disposer
Name | Disposal
Date |
|------------------------------|---------------------------|-----------------------|------------|--------------------------------|--------------------|-----------------------------|---------------------|-------------------|----------------------------------|------------------|
| 49
15 | PCB Container | Repk DM
PCB Debris | | 10-02-90 | Gen.
at
site | 157.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
16 | PCB Container | Repk DM
PCB Debris | | 10-02-90 | Gen.
at
site | 142.5 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
17 | PCB Container | Repk DM
PCB Debris | | 10-02-90 | Gen.
at
site | 180.0 | 91045 | 03-22-91 | Rollins Env Ser
Deer Park, TX | 06-17-91 |
| 49
18 | PCB Container | DM PCB H2O | | 10-02-90 | Gen.
at
site | 98.0 | 91025 | 02-27-91 | Rollins Env Ser
Deer Park, TX | 03-07-91 |

TOTAL 0.0 578.0

Drums #6, 13, 14, were shipped in drums in which the material could not be removed for disposal.
 These three (3) drums were repacked, generating three (3) additional drums of debris and one (1) drum of water.
 The three (3) empty drums were left inside the 85 gallon overpacks and will be shipped for incineration.

850131127

TEXAS WATER COMMISSION
P.O. Box 13087, Capitol Station
Austin, Texas 78711-3087



Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form approved. OMB No. 2050-0059, expires 09-30-91

| | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------|--|------------------------------------|--------------------------------|-----------------------------------------------------|--------------------|-----------------------------------------------------------------|--------------|
| UNIFORM HAZARDOUS WASTE MANIFEST | | 1. Generator's US EPA ID No.
N J D 0 0 2 4 4 4 9 3 3 | | Manifest Document No.
0 6 6 0 8 | | 2. Page 1 of | | Information in the shaded areas is not required by Federal law. | |
| 3. Generator's Name and Mailing Address
Monsanto Chemical Company
Foot of Pennsylvania Avenue
Kearny, New Jersey 07032 | | | | | | 24 Hour Emergency:
Plant Guard
(201) 589-0350 | | | |
| 4. Generator's Phone (201) 589-0350 | | | | | | A. State Manifest Document Number
No 00542954 | | | |
| 5. Transporter 1 Company Name
Custom Environmental Transportation | | | | | | B. State Generator's ID
99934 | | | |
| 6. US EPA ID Number
D E D 9 8 0 9 1 8 8 5 8 | | | | | | C. State Transporter's ID
40756 | | | |
| 7. Transporter 2 Company Name | | | | | | D. Transporter's Phone
(713) 930-4500 | | | |
| 8. US EPA ID Number | | | | | | E. State Transporter's ID | | | |
| 9. Designated Facility Name and Site Address
Rollins Environmental Service
P.O. Box 609/ 2027 Battleground Rd.
Deer Park, TX 77536 | | | | | | F. Transporter's Phone | | | |
| 10. US EPA ID Number
T X D 0 5 5 1 4 1 3 7 8 | | | | | | G. State Facility's ID
50089 | | | |
| H. Facility's Phone
(713) 930-4500 | | | | | | | | | |
| 11A. HM | 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | | | | | 12. Containers No. | 13. Total Quantity | 14. Unit Wt/Vol | 1. Waste No. |
| a. | RQ Hazardous Substances Solid N.O.S
ORM-E NA 9188(Polychlorinated Biphenyls) | | | | | 0 2 0 M | 5 3 0 | K | None |
| b. | | | | | | | | | |
| c. | | | | | | | | | |
| d. | | | | | | | | | |
| J. Additional Descriptions for Materials Listed Above
PCB Contaminated Soil | | | | | | K. Handling Codes for Wastes Listed Above | | | |
| 15. Special Handling Instructions and Additional Information
1. PCB Manifest
2. New Jersey State Hazardous Waste Code: X751- PCB Solids from Non-Specific Source
3. Lab Reference- HO 50306 | | | | | | | | | |
| 16. GENERATOR'S CERTIFICATION. I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, including applicable state regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. | | | | | | | | | |
| Printed/Typed Name
CELSO BALAN | | | | | Signature
<i>Elmora</i> | | | Month Day Year
08/26/91 | |
| 17. Transporter 1 Acknowledgement of Receipt of Materials | | | | | | | | | |
| Printed/Typed Name
AARON ROWE | | | | | Signature
<i>Aaron Rowe</i> | | | Month Day Year
08/26/91 | |
| 18. Transporter 2 Acknowledgement of Receipt of Materials | | | | | | | | | |
| Printed/Typed Name | | | | | Signature | | | Month Day Year | |
| 19. Discrepancy Indication Space | | | | | | | | | |
| 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. | | | | | | | | | |
| Printed/Typed Name | | | | | Signature | | | Month Day Year | |

#MW-1

0' - 1' Brown Loose Silt and Cinder, Wood, Glass-FILL
1' - 9' Black Silt w/Trace Clay, Misc.-FILL
9' - 10' Yellow Brown Misc.-FILL
10' - 20' Brown Silty Clay

MAY 14 1988
DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850131129

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269073

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/6/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 17'6" Feet
5. CASING: Type PVC Diameter 4 inches Length 2'6" Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 15 Feet
- Range in Depth { Top 2'6" Feet
Bottom 17'6" Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color 1-1-1 Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131130

704-2

0' - 5' Brown Silt w/Fine Sand, Clay at Bottom
5' - 14' Dark Brown Black, Very Dense Silty Clay
14' - 17'6" Brown Sand w/Some Gravel

Nov 14 '88

DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850131131

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623112

PERMIT NO. 269074

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER N.J. TURNPIKE AUTHORITY ADDRESS _____
Owner's Well No. MW-3 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: 5002 Municipality: Newark
3. DATE COMPLETED 5/6/86 DRILLER J. E. Fritts
4. DIAMETER: Top 4 inches Bottom: 4 inches TOTAL DEPTH 11' Feet
5. CASING: Type PVC Diameter 4 inches Length 1' Feet
6. SCREEN: Type PVC Size of Opening .020 Diameter 4 inches Length 10' Feet
- Range in Depth { Top 1 Feet
Bottom 11 Feet
- Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type None Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ 89 FTYH Temp. _____ °F.
12. LOG _____ Are samples available? _____
(File directly on back of sheet or on separate sheet. If cassette log was made, please furnish copy.)
13. SOURCE OF DATA Drillers Log
14. DATA OBTAINED BY J. E. Fritts & Assoc., Inc. Date 5/12/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131132

#M-3

0' - 3' Brown Sandy Silt w/Fine to Medium Gravel
3' - 6' Black Cinders w/Fine to Medium Gravel
6' - 8' Brown Organic Peat
8' - 11' Black Cinder and Fine to Medium Gravel w/
little Peat and Fine Sand

Nov 14 '88

DEPT. ENV. PROTECTION
DIV. OF WATER RESOURCES
WATER ALLOCATION

850131133

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-112

PERMIT NO 2610407
APPLICATION NO _____
COUNTY Essex

WELL RECORD

1. OWNER Stanley Tool ADDRESS Newark, New Jersey
Owner's Well No. MW-12 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: 20,21,22&23 Block: 2445
3. DATE COMPLETED March 27, 1987 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER. Top 4 inches Bottom 4 inches TOTAL DEPTH 16.0' Feet
5. CASING: Type PVC Diameter 4 inches Length 6.0' Feet
6. SCREEN: Type PVC Size of Opening .010 Diameter 4 inches Length 10.0' Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet
- Geologic Formation _____
- Foot Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT.
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(See details on back of sheet or on separate sheet. If separate log was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Chris O'Shaughnessy & Supervisor: Jerry Date April 13, 1987
Malack #1167

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

(GAS)
**FOR MONITORING
PURPOSES ONLY**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23113
PERMIT NO. 26-5291
APPLICATION NO. _____
COUNTY ESSEX

WELL RECORD

1. OWNER Essex Chemical Corporation ADDRESS 1401 Broad St. Clifton, New Jersey 07015
Owner's Well No. T-1 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Doremus Ave.
3. DATE COMPLETED 10-5-81 DRILLER: H. P. Drilling, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 25 Feet
5. CASING: Type PVC Diameter 2 inches Length 22 Feet
6. SCREEN: Type Cont. slot Size of Opening .020 Diameter 2 inches Length 20 Feet
- Range in Depth { Top 5 Feet
Bottom 25 Feet
- Geologic Formation _____
- Tail Piece: Diameter XXX inches Length XXX Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date No test taken Yield _____ Gallons per minute
Static water level before pumping 4 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Gas Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Yes- Attached Are samples available? No
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA H. P. Drilling, Inc.
14. DATA OBTAINED BY H. P. Drilling, Inc. Date 10-5-81

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131135

26.23.113

26-529

Date 10/5/81

Job No. 446

| GROUND WATER DATA | | | METHOD OF ADVANCING BORING | | DEPTH | |
|-------------------|------|---------|----------------------------|---------------|-------|-----|
| DEPTH | HOUR | DATE | A | | | |
| 4' | | 10/5/81 | | Rotary Method | 0 | 25' |
| | | | | | | |
| | | | | | | |

S - 2" O.D. Split Spoon Sample
 U - Undisturbed Sample, 3" Diameter
 - - Core Drilling
 N - Standard Penetration Resistance per 6"
 (140# hammer, 30" drop)
 N.R. - No Recovery

Helper Gerald Freck

850131136

Form DWR-138
11/80

(GAS)
FOR MONITORING
PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

WELL RECORD

26-23-113
PERMIT NO. 16-5502
APPLICATION NO. _____
COUNTY MONMOUTH

- 0701
1. OWNER Essex Chemical Corporation ADDRESS 1401 Broad St. Clifton, New Jersey
Owner's Well No. T-2 SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Doremus Ave.
3. DATE COMPLETED 10-2-81 DRILLER H. P. Drilling, Inc.
4. DIAMETER: Top 2 inches Bottom 2 inches TOTAL DEPTH 25 Feet
5. CASING: Type PVC Diameter 2 inches Length 7 Feet
6. SCREEN: Type Cont. slot Size of Opening .020 Diameter 2 inches Length 20 Feet
- Range in Depth { Top 5 Feet
Bottom 25 Feet } Geologic Formation _____
- Tail Piece: Diameter XX inches Length XX Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date No test taken Yield _____ Gallons per minute
Static water level before pumping 12 Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR Gas Monitoring AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG Yes- Attached Are samples available? No
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA H. P. Drilling, Inc.
14. DATA OBTAINED BY H. P. Drilling, Inc. Date 10-2-81

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131137

FOR INFORMATION PURPOSES ONLY

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623113

26-7254

PERMIT NO. _____

APPLICATION NO. E-35X

COUNTY _____

WELL RECORD

GETTY REFINING AND MARKETING

86 DOREMUS AVE.

1. OWNER _____ ADDRESS _____

Owner's Well No. _____ SURFACE ELEVATION _____ Feet
Lot: _____ Block: _____ Municipality: Newark (Above mean sea level)

2. LOCATION _____ Warren George Inc.

3. DATE COMPLETED _____ DRILLER _____

4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet

5. CASING: Type _____ Diameter _____ inches Length _____ Feet

6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute

Static water level before pumping _____ Feet below surface

Pumping level _____ feet below surface after _____ hours pumping

Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown

How pumped _____ How measured _____

Observed effect on nearby wells _____

9. PERMANENT PUMPING EQUIPMENT:

Type _____ Mfrs. Name _____

Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____

Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet

Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

11. QUALITY OF WATER _____ Sample: Yes _____ No _____

Taste _____ Odor _____ Color _____ Temp. _____ °F.

12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)

13. SOURCE OF DATA Boring Log

14. DATA OBTAINED BY Warren George, Inc Date 1/5/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131138

Form DWR-138
11/80

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Coord: 2623113

PERMIT NO. 26-7255

APPLICATION NO. _____

COUNTY Essex

WELL RECORD

1. OWNER GETTY REFINING AND MARKETING ADDRESS 86 DOREMUS AVE.
Owner's Well No. _____ SURFACE ELEVATION _____ Feet
(Above mean sea level)
2. LOCATION Lot: _____ Block: _____ Municipality: Newark
3. DATE COMPLETED _____ DRILLER Warren George Inc.
4. DIAMETER: Top _____ inches Bottom _____ inches TOTAL DEPTH _____ Feet
5. CASING: Type _____ Diameter _____ inches Length _____ Feet
6. SCREEN: Type _____ Size of Opening _____ Diameter _____ inches Length _____ Feet
- Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____
- Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily }
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy.)
13. SOURCE OF DATA Boing Log
14. DATA OBTAINED BY Warren George, Inc. Date 1/5/85

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

850131139

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26-23-113

PERMIT NO 2609705

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-2 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445 (Above mean sea level)
2. LOCATION _____
3. DATE COMPLETED 10/20/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 19.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 9.0 Feet
6. SCREEN: Type PVC Size of Opening 010 Diameter 4 inches Length 10.0 Feet

Range in Depth { Top _____ Feet
Bottom _____ Feet } Geologic Formation _____

Tail Piece: Diameter _____ inches Length _____ Feet

WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface

Water rises to _____ Feet above surface

7. RECORD OF TEST: Date _____ Yield _____ Gallons per minute
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____

8. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfr. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size _____ inches

9. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily

10. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.

11. LOG _____ Are samples available? _____
(Note details on back of sheet or on separate sheet. If sheets log was made, please furnish copy.)

12. SOURCE OF DATA _____

13. DATA OBTAINED BY Jeffrey JAWORSKI #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

26.23.113

PERMIT NO. 2609674-9

FOR MONITORING PURPOSES ONLY

WELL RECORD

APPLICATION NO _____
COUNTY ESSEX

1. OWNER STANLEY TOOLS ADDRESS 140 CHAPEL STREET, NEWARK, NEW JERSEY
Owner's Well No. MW-10 SURFACE ELEVATION _____ Feet
LOT: 20, 21, 22, 23 BLOCK: 2445
2. LOCATION _____
3. DATE COMPLETED 10/10/86 DRILLER EMPIRE SOILS INVESTIGATIONS, INC.
4. DIAMETER: Top 4 inches Bottom 4 inches TOTAL DEPTH 20.0 Feet
5. CASING: Type PVC Diameter 4 inches Length 10.0 Feet
6. SCREEN: Type PVC Size of Opening 0.10 Diameter 4 inches Length 10.0 Feet
Range in Depth { Top _____ Feet
Bottom _____ Feet
Geologic Formation _____
Tail Piece: Diameter _____ inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per minute at _____ Feet above surface
Water rises to _____ Feet above surface
Yield _____ Gallons per minute
8. RECORD OF TEST: Date _____
Static water level before pumping _____ Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How pumped _____ How measured _____
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Motor on Pump _____ Size _____ inches
10. USED FOR _____ AMOUNT { Average _____ Gallons Daily
Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes _____ No _____
Taste _____ Odor _____ Color _____ Temp. _____ °F.
12. LOG _____ Are samples available? _____
(Give details on back of sheet or on separate sheet. If check tag was made, please furnish copy.)
13. SOURCE OF DATA _____
14. DATA OBTAINED BY Jeffrey Jankowski #1315 Date 10/31/86

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements, etc.)

APPENDIX M

Potential Off Site Sources for Chlorobenzene.

List of Industrial Sites Identified Within Approximately One Mile of the Kearny Monsanto Plant.

1. M.S.L.A. Landfill AKA M.S.L.A. 1D
Kearny, New Jersey
NJDPES DGW #NJ0051837
2. Port Authority of New York and New Jersey
Kearny, New Jersey
No NJPDES DGW#
3. Hackensack Meadowlands Development Commission
 - a) H.M.D.C. Kearny 1A SLF
Kearny, New Jersey
NJPDES DGW# NJ0053074
 - b) H.M.D.C. 1C
Kearny, New Jersey
NJPDES DGW #NJ0053244
 - c) Hudson County Ash Residue SLF
Hudson County Improvement Authority
Administration Building
Kearny, New Jersey
NJPDES DGW #NJ0069221
4. Koppers Company, Inc.
Koppers Coke Site
Kearny, New Jersey
NJPDES DGW #NJ0066125
5. American President Lines, LTD.
(Located next door to Monsanto Kearny Plant)
Several monitoring wells installed in 1989
Kearny, New Jersey
No NJPDES DGW#
6. Janatex
Kearny, New Jersey
Bureau of Underground Storage Tanks
Case #90-05-15-1423
7. Syncon Resins Corporation
ongoing RI/FS Remediation
Kearny, New Jersey
NJPDES DGW #NJ0020443 (ECRA)
8. Western Electric
AT&T Technologies, Inc.
Kearny, New Jersey
NJPDES DGW #NJ0020443 (ECRA)
9. Diamond Shamrock
Kearny, New Jersey
10. Kearny Drum Dump #3
Kearny, New Jersey
(Division of Hazardous Site Mitigation)
11. Standard Chlorine Chemical Company
Kearny, New Jersey
NJPDES DGW #NJ0001856
12. Amtrack Electrical Substation #41
National Passenger Railroad Corporation
Kearny, New Jersey
NJPDES DGW #NJ0071811
13. Capital City Products
Kearny, New Jersey
NJPDES DGW #NJ0098906
14. Kearny Smelting and Refining Company
Kearny, New Jersey
NJPDES DGW #NJ0068268
15. USPS Northern New Jersey Facility
850 Newark Turnpike
Kearny, New Jersey
UST# 0157250

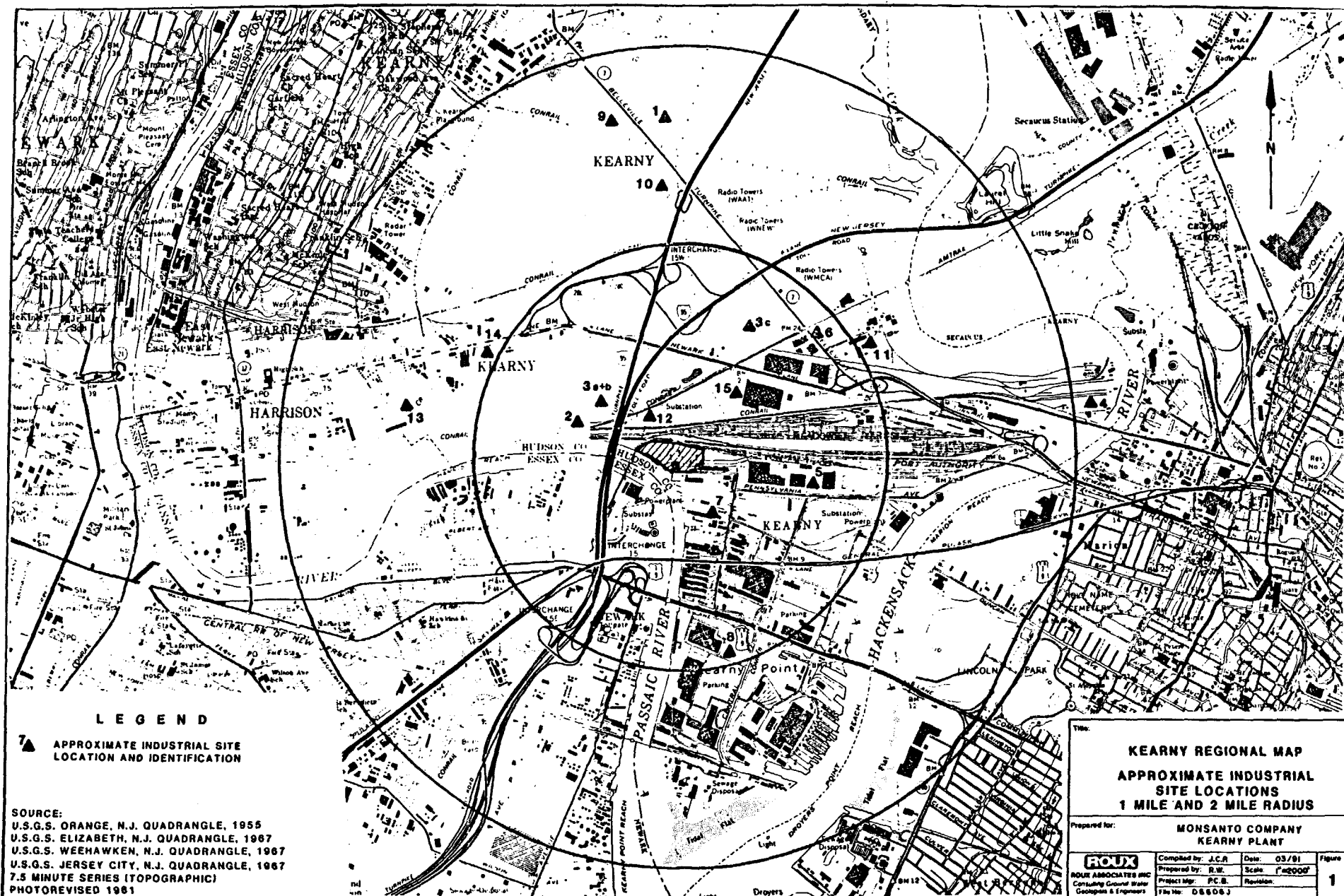


EXHIBIT D

Exhibit D, "Report for Interim Remedial Measures", will be produced as soon as a copy can be located.

EXHIBIT E

850131147

EXHIBIT D

Exhibit D, "Report for Interim Remedial Measures", will be produced as soon as a copy can be located.

EXHIBIT E

**FOCUSED FEASIBILITY STUDY
AND
IDENTIFICATION OF SITE
SPECIFIC CLEANUP STANDARDS**

**MONSANTO KEARNY PLANT
Kearny, New Jersey**

June 18, 1993

Prepared for:

**MONSANTO COMPANY
Pennsylvania Avenue
Kearny, New Jersey**

Prepared by:

**ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066**



850131151

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EXECUTIVE SUMMARY

Monsanto Company (Monsanto) owns and previously operated an industrial chemical plant located in Kearny, New Jersey. Manufacturing activities were terminated in December 1991, and facility decontamination and demolition are complete. An Administrative Consent Order (ACO) to conduct a Remedial Investigation and Feasibility Study (RI/FS) was executed between Monsanto and the New Jersey Department of Environmental Protection and Energy (the Department) on June 24, 1989. Upon notification of intended termination of site operations and submission of pertinent filing forms, the Department formally incorporated all Environmental Cleanup Responsibility Act (ECRA) requirements into the ACO in correspondence dated January 13, 1992. Upon completion of its ACO and ECRA obligations at the site, Monsanto intends to sell the property and remaining improvements for non-residential operations.

A series of site investigations, both prior to and after execution of the ACO, resulted in Department approval of the RI on May 7, 1992. The Department-approved RI included the following general conclusions:

- An extensive soils investigation indicated the absence of broad impact from site operations;
- Two known disposal episodes of polychlorinated biphenyl (PCB) containing heat transfer fluid resulted in three defined areas of PCB-impacted soil;
- An extensive hydrogeologic investigation defined hydraulic conditions, geologic conditions, and ground-water quality beneath the site;
- A two aquifer system, with a confining peat layer between, has been confirmed in the shallow subsurface; and a downward vertical hydraulic head is demonstrated;
- Identified impact to ground water is limited and primarily the result of background conditions which are consistent with the known industrial setting of the facility; and

- Monsanto's preliminary cleanup activities in 1979, combined with site-specific hydrogeologic conditions, have prevented the migration of PCBs outside the three known areas of concern.

Upon approval of the RI, the efforts of Monsanto and the Department shifted to determination of appropriate cleanup standards for the site and completion of the ACO required FS. In an effort to facilitate the completion of the FS, and as required under the ACO, Monsanto prepared a site-specific risk assessment and included it in the RI Report. The Department has notified Monsanto that certain specific exposure assumptions included in the site-specific risk assessment are not in accordance with current NJDEPE guidance. Over the same time period, the Department was requesting that the regulated community comply with the requirements of its proposed new rules dated February 3, 1992 which presented cleanup standards for contaminated sites. These proposed rules also identified certain criteria and general procedures for the establishment of Department-approved Alternate Cleanup Standards (ACSs). The ACS petitioning process formerly proposed by the Department has, as of February 3, 1993, been withdrawn for use in the decision making process associated with site remediation. While Monsanto and the Department have agreed to continue to utilize the formerly proposed rules for guidance in determining site remediation goals, Monsanto reserves its rights as defined in the ACO and elsewhere.

In order to implement remedial actions at the site in a timely manner, Monsanto and the Department agreed to replace the FS Workplan and FS with a Focused FS (FFS). This FFS carefully evaluates site conditions with respect to current Department petitioning criteria and demonstrates that the proposed remedial alternative meets the Department's requirements for a pre-approved remedial action. The pre-approved remedial objectives agreed to by the Department and Monsanto include hot spot removal combined with appropriate engineering and institutional controls. The FFS includes an abbreviated version of the FS screening procedures which were employed to identify excavation and solidification as technologies capable of meeting the pre-approved objectives. These remedial technologies were fully evaluated during the FFS to determine a recommended remedial alternative appropriate for the site.

Based on careful review of the Department's guidance criteria and evaluation of site-specific conditions, the following site-specific cleanup standards (SCSs) are presented:

- Remediation of surface soils (0-2 feet below ground surface) is proposed for PCBs in three defined areas of concern (AOCs). A SCS for surface soils of 25 parts per million (ppm) total PCBs is appropriate for a non-residential area where engineering and institutional controls will be employed.
- Remediation of subsurface soils is proposed for PCBs in three defined AOCs. The Department's subsurface cleanup guidance level of 100 ppm total PCBs will be met in each of the three AOCs including those soils within and below the confining peat layer in the PDA. A SCS for subsurface soils is appropriate for a non-residential area where engineering and institutional controls will be employed.
- Remediation of ground water is not proposed. The identified impact to ground water is limited, and those few compounds exceeding the proposed cleanup standards in the shallow ground water zone represent industrial background conditions for the area. Monitoring of the ground water has been proposed and is described in Subsection 6.1.1.1 of this FFS.

In accordance with Monsanto and Department objectives, establishment of the SCSs described above will permit the implementation of a timely and appropriate pre-approved remedial action for the site. Based on these criteria, a limited number of remedial alternatives were considered appropriate for the site. Prior to implementation of the FFS, Monsanto and the Department agreed that a pre-approved remedial action would incorporate a removal action combined with engineering and institutional controls. The FFS was employed to efficiently identify a specific removal or immobilization approach which meets Department evaluation criteria and is acceptable to Monsanto. The remedial approach selected is designed to complete all of Monsanto's remedial obligations and result in termination of the ACO and closure under ECRA. The proposed remedial approach includes excavation, off-site landfilling, on-site treatment of water generated during excavation, asphalt capping of the AOCs, replacement of a local peat layer where disturbed with material of equal or lesser permeability, and a deed restriction. The

SCSs and the proposed remedial action are incorporated into a formal petition for Department review and approval in this report. Upon Department review, comment, and approval of the SCS petition, a detailed Remedial Action Plan will be prepared for implementation of the selected remedy.

1.0 INTRODUCTION

Monsanto Company (Monsanto) owns and previously operated an industrial chemical plant located on Pennsylvania Avenue in Kearny, New Jersey. The site manufactured detergent ingredients until December 1991, when production ceased. A site location map and a pre-demolition site plan are provided as Figures 1 and 2, respectively. The facility decontamination and demolition are complete, and a site plan showing current conditions is included as Figure 3.

Monsanto executed an Administrative Consent Order (ACO) to conduct a Remedial Investigation and Feasibility Study (RI/FS) with the New Jersey Department of Environmental Protection and Energy (the Department) on June 24, 1989 ¹. The RI was performed to evaluate the sources and extent of polychlorinated biphenyls (PCBs) and other compounds of concern in the soils and ground water at the site. In correspondence dated May 7, 1992 ², the Department approved the RI and directed Monsanto to complete the FS Workplan. In correspondence dated September 16, 1992 ³, the Department agreed that Monsanto should replace the FS Workplan and FS with a Focused FS (FFS), and include a petition for Alternate Cleanup Standards (ACSs) in the FFS. Subsequently the Department advised Monsanto that the petition for ACSs would function as the basis for which site-specific cleanup standards (SCSs) will be approved.

This report summarizes the findings of the RI Report ⁴, and presents site background information in sufficient detail to support a petition for applicable SCSs. The particular criteria which need to be supported to permit the Department's approval of these SCSs are as follow:

- The site meets the Department's non-residential criteria; and
- The proposed SCSs will be protective of human health and the environment and will not permit contaminant migration via any expected migration pathways.

Site-specific conditions, combined with proposed remedial actions such as hot spot removal and engineering controls, make this site a good candidate for the establishment of SCSs. Monsanto's

ability to implement certain institutional controls further satisfies Department requirements for a pre-approved remedial action.

This document is divided into nine sections, with references, tables and figures located at the end of the report. Section 2.0 provides background information and summarizes previous site investigations and results as described in the RI Report. Section 3.0 presents applicable or relevant and appropriate requirements (ARARs) and then identifies proposed media-specific SCSs relevant to the site. These SCSs are appropriate based on the background information presented in Section 2.0, and they are approvable in conjunction with the proposed remedial actions described in subsequent sections. The formal petition for SCSs for both surface and subsurface soils is presented in Section 4.0. Prior to implementation of the FFS, Monsanto and the Department agreed that a pre-approved remedial action would include hot spot remediation. The original listing of all identified remedial treatment technologies and the initial screening process which was conducted to select the remedial technologies which could meet the pre-approved objectives are described in Section 5.0. The remaining remedial action alternatives are identified, described, screened, and a recommended remedial action alternative is selected in Section 6.0. The conceptual design and schedule of activities for the recommended remedial action alternative are presented in Sections 7.0 and 8.0, respectively. The information to be included in the Remedial Action Plan is outlined in Section 9.0.

2.0 REMEDIAL INVESTIGATION SUMMARY

This section summarizes information presented in the RI Report. Background information is presented in sufficient detail to support the petition for media-specific SCSs. More detailed information which supports the summaries below is located in the tables, figures and appendices of the RI Report. The manufacturing history, regulatory history, previous investigations, site setting, geology, hydrogeology, and the analytical results are summarized below.

2.1 Manufacturing History

The Monsanto Kearny plant began process operations in 1955. The plant manufactured phosphoric acid and sodium tripolyphosphate (STP) from 1955 until 1985. These process units were located in the eastern part of the plant site. In 1966, new production units for the phosphoric acid and STP processes were added. These operations were terminated in 1985, and the units were subsequently dismantled. The manufacturing of Steroxes began in 1956, followed by alkylphenol (AP) production in 1960. AP was manufactured on-site until 1991, with the process units previously located in the central portion of the site. Sterox production ended in 1990; these process units were located adjacent to the AP units. A chronological summary of primary process operations is presented in Table 1, and a pre-demolition site plan is shown as Figure 2. At the present time, there are no manufacturing activities conducted at the site, and the only remaining buildings are the former warehouse and office (see Figure 3).

The RI Report contains a complete description of each manufacturing process, including the raw and waste materials and disposal practices associated with each product. This information was gathered through historical file review and interviewing plant personnel regarding site operations. The design of the RI Workplan ⁵ was based on a thorough understanding of the manufacturing history. One particular aspect of the manufacturing history which warrants a brief explanation in this FFS is described below.

From 1960 to 1972, the heat-transfer fluid used in the thermal system for the AP process contained PCBs, which were used for their fire-resistant and relatively inert characteristics. During a process upset in 1967-68, the reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the mixture became gel-like and

unusable. A disposal pit was excavated next to the control room and approximately 2,000 gallons of PCB thermal fluid were drained from the tank and heater to an excavated pit which is currently referred to as the PCB Disposal Area (PDA). The thermal system was recharged with PCB heat transfer fluid at that time. When the system was converted in 1972 to a non-PCB fluid, the tank containing 2,000 gallons of PCB thermal fluid was again drained to the PDA. In 1979, preliminary cleanup of the PDA was conducted by excavation and proper disposal of approximately 85 cubic yards of PCB saturated soils. The PDA is the primary AOC at the site and is shown as one of the three areas to be addressed on Figure 4.

2.2 Regulatory History

Monsanto entered into an ACO with the Department on June 24, 1989 to implement a RI/FS. Using information from earlier investigations, and in compliance with the ACO, Roux Associates, Inc. developed a Remedial Investigation Work Plan (RI Workplan), dated December 18, 1989 ⁵, a RI Work Plan-Addendum I (Addendum I), dated May 18, 1990 ⁶, and subsequently a Revised RI Work Plan-Addendum II (Addendum II), dated May 5, 1991 ⁷. The RI Workplan and subsequent Addenda I and II, were commented on and modified by Department personnel to ensure full characterization of site conditions.

The RI was performed to evaluate the sources and extent of PCBs and other compounds of concern in the soils and ground water and to identify potential migration pathways for these compounds. Upon completion of all field activities, a Preliminary Remedial Investigation Report (Volumes I, II, and III) was submitted to the Department on August 30, 1991 ⁴. A series of correspondence between Roux Associates, Inc. or Monsanto and the Department served to resolve several questions and concerns. Monsanto received a conditional approval of the RI Report in correspondence dated May 7, 1992 ² and was directed to submit a draft FS Workplan (FSWP).

In accordance with correspondence dated September 16, 1992 from the Department to Monsanto, this FFS report is being submitted in lieu of a Draft and Final FSWP and FS ³. In this correspondence, the Department confirms that this alternative to submission of the ACO-required FSWP and FS, is deemed acceptable since the AOCs at the site have been fully characterized, are media specific, and are of limited extent. The FFS has been designed to identify remedial

alternatives, select the most appropriate remedial action, and petition for SCSs for surface and subsurface soils on the site.

2.3 Site Investigations

Subsurface investigation activities began at the Monsanto Kearny Plant in the early 1970s and continued through the completion of the RI Report. The findings and conclusions for this site have been based on a comprehensive series of investigations which have been presented in detail in the RI Report. Most of the investigations were designed to build upon and refine the information from earlier investigations. A brief description of the chronology of site investigation activities is presented below.

- | | | |
|-------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • Monsanto | 1970s | Reviewed historical operating practices and prioritized potential areas of concern. |
| • Monsanto | 1982 | Initiated plant program to assess subsurface environmental quality and prevent future releases. |
| | 1983 | Installed 8 ground-water monitoring wells. |
| • Storch Engineers | 1983 | Collected 5 surface soil samples and drilled and sampled 29 soil borings in the original PCB disposal area (PDA). |
| • OH Materials Corp. | 1984 | <u>Phase I:</u> Drilled and sampled 10 soil borings in the AP/Sterox process area. Installed and sampled four ground-water cluster well sets and one single well. Excavated 4 test pits in immediate area of cluster wells. |
| | | <u>Phase II:</u> Conducted water-level gauging. Installed and sampled 6 soil borings in secondary settling pond area. |
| | 1985 | <u>Phase III:</u> Excavated 13 test pits in the general AP/Sterox process area. |
| | | <u>Phase IV:</u> Installed and sampled 3 additional soil borings. Conducted permeability testing. |
| • Monsanto | 1985 | Conducted ground-water sampling. |
| • OH Materials Corp. | 1986 | Conducted ground-water sampling. Implemented interim remedial measures. |
| | 1987 | Conducted ground-water sampling. |
| • Roux Associates, Inc. | 1988 | Conducted ground-water sampling. |

- Roux Associates, Inc. 1990 Installed 14 ground-water monitoring wells and 9 observation points. Abandoned 5 ground-water monitoring wells.

Conducted quarterly ground-water gauging and sampling of 26 monitoring wells - June, August, September and December.

Conducted air quality monitoring and analysis study.

Completed ground-water recovery test to determine hydraulic characteristics.

Conducted Phase I soil investigation which included a series of surface soil samples and subsurface soil borings.

Completed 8-day tidal influence study.
- 1991 Completed quarterly ground-water gauging sampling - March.

Conducted Phase II soil investigation which included a series of surface soil samples and subsurface soil borings.
- 1992 Abandoned 9 ground-water monitoring wells.

2.4 Site Setting

The Monsanto Kearny Facility is located on Pennsylvania Avenue in the town of Kearny, Hudson County, New Jersey. The site is bordered by the Passaic River on the west, a Conrail Railroad Yard on the north, and to the south and east by warehouses and trucking distribution facilities. The facility occupies approximately 28 acres in Kearny Point, a highly industrialized area of Kearny. The plant site is located on the east bank of the Passaic River, approximately 1.6 miles north of its confluence with the Hackensack River at Newark Bay. Occupancy in the immediate area includes major manufacturing, distribution, and transportation facilities.

The residential area of Kearny is located approximately 2 miles northwest of the plant with an approximate population of 36,000. Harrison, with a population of approximately 12,250 is also located approximately 2 miles west-northwest of the Monsanto facility. The closest residential area, the City of Newark, is located approximately 1 mile west-southwest of the facility, across the Passaic River.

The plant site was used as a rail yard prior to purchase and development by Monsanto in the early 1950s. Recent plant operations included the manufacturing of alkylphenols (AP) and the warehousing and distribution of other Monsanto products. The site and the surrounding properties are clearly non-residential properties based on current uses. Any foreseeable future operations in this neighborhood would be expected to fall within Standard Industrial Classification (SIC) codes clearly associated with non-residential properties. The deed restriction in the pre-approved remedial action can be employed to ensure the future use of the property is limited to non-residential applications.

2.5 Site Geology

Subsurface investigations conducted to date by Monsanto and Roux Associates, Inc. have indicated the presence of at least four distinct geologic units in the shallow subsurface beneath the site. Numerous borings and test pits were drilled to characterize the stratigraphy of the unconsolidated sediments. Geologic literature shows that the stratigraphy described for the site is typical for the area. Figure 5 shows the location of current and former monitoring wells and includes the location of hydrogeologic transects. Two site-specific geologic cross sections are presented as Figures 6 and 7, respectively. Complete documentation of geologic findings including geologic logs of all borings can be found in the RI Report. The four shallow stratigraphic units encountered beneath the site are described as follow:

- The uppermost unit consists of 2 to 7 feet of fill material, underlain by approximately 5 feet of silty medium to coarse sand with gravel. From the surface of the site, the first unit ranges in thickness between 7 and 12 feet. This unit is thinnest adjacent to the Passaic River located on the southwest boundary of the site and is thickest in the central part of the site.
- The second stratigraphic unit consists of peat and clay. It begins at an average depth of approximately 12 feet below ground surface (BGS), and ranges in thickness between 5 and 8 feet. It is thickest adjacent to the Passaic River. It has a low permeability and is a locally continuous, natural confining unit. Prior to development of this site for industrial use, this may have been the original ground surface.

- The third stratigraphic unit consists of coarse sand with some silt and gravel. It begins at an average depth of 18 feet BGS. This unit has an average thickness of approximately 10 feet across the site and is thickest on the eastern portion of the site.
- The fourth stratigraphic unit, encountered at approximately 28 feet BGS, consists of alternating silt and clay laminations which form thin light and dark colored bands. This stratified deposit is typical of sediments deposited by glacial meltwater in lakes (glacio-lacustrine deposits) during the end of the Pleistocene Ice Age. Review of well records of ground-water wells within 1 mile of the site and regional geologic literature indicates that the thickness of this Pleistocene age lacustrine clay varies from 30 to 50 feet. This unit has a very low permeability and is considered a hydraulic barrier between the recent fluvial sediments and the underlying Triassic Age bedrock.

2.6 Site Hydrogeology

Hydrogeologic and subsurface investigations conducted by Monsanto and Roux Associates, Inc. have indicated the presence of two water-bearing zones within the upper 30 feet of sediment, separated by a locally continuous, natural confining unit of peat and clay. A relatively impermeable boundary of silt and clay lies below the two water-bearing zones. The two water-bearing zones beneath the site are not sources of drinking water due to the shallow depth to the upper water-bearing zone and the saline characteristics of the lower water-bearing zone. Both water-bearing zones discharge to the Passaic River, which is tidally influenced.

The upper water-bearing zone occurs within the first lithologic unit of fill material and coarse sand. It is an unconfined water-bearing zone, and the water table occurs between 2 to 4 feet BGS. In the upper water-bearing zone limited tidal influence has been observed during high tides.

The lower water-bearing zone occurs within the third lithologic unit which consists of coarse sand with some silt and gravel. The unit is completely saturated with water and confined between two semi-permeable lithologic units. The static head rises above the overlying peat and clay unit, separating the upper and lower unconsolidated water-bearing zones. The hydraulic head data from well couplets screened in the upper and lower water-bearing zones reveals a

downward vertical hydraulic gradient across the entire site. A distinct tidal influence was observed in the lower water-bearing zone, and ground-water chemistry shows elevated concentrations of constituents of saline water.

2.7 Analytical Results

Subsurface investigation activities began at the site in the early 1970s and continued through the completion of the RI Report. A brief description of the chronology of site investigation activities was provided in Subsection 2.3. A comprehensive presentation which describes and integrates the findings from all of the site investigations is provided in the RI Report. In the preliminary site investigations, five areas of concern were identified as the Acid Sump (AS), Alkylphenol/Sterox Sump (APSS), Secondary Settling Pond (SSP), Tertiary Settling Pond (TSP), and the PCB Disposal Area (PDA). Surface and subsurface soils in these five potential AOCs were further investigated in the RI, and the AS and TSP were eliminated as AOCs. The ground water beneath the site was fully evaluated during the RI, and the impact was considered limited.

In correspondence dated September 16, 1992, the Department identified that the AOCs at the site have been fully characterized, are media-specific, and are of limited extent. The Department and Monsanto agree that the three AOCs include the PDA, the APSS and the SSP. The media of concern for each of these areas is surface and/or subsurface soils which are primarily impacted by PCBs. Any low-level, residuals outside of these AOCs will be managed by the engineering and institutional control aspects of the proposed remedial action. The impact to ground water is limited and primarily the result of background conditions which are consistent with the known industrial setting of the facility. A series of PCB isoconcentration maps for soils in the PDA, APSS, and SSP are included as Figures 8 through 22, 23 and 24, and 25 and 26, respectively. A summary of the pertinent analytical conclusions for each of the three AOCs is provided in the subsections below.

2.7.1 PCB Disposal Area (PDA)

The PDA has been sampled extensively over time. The horizontal distribution of PCBs in surface soils is shown on Figure 8, and the vertical distribution over two-foot intervals is depicted in Figures 9 through 22. As indicated in the figures, the maximum concentrations are present at the 4 to 6 foot interval BGS with a significant decreasing trend to a depth of 10 to 12

feet BGS. There is a slight increase observed from 12 to 16 feet BGS within the confining peat layer. As shown, the concentrations of PCBs in surface soils ranged from non-detect to approximately 30,000 ppm in the core of the PDA. The subsurface soil exhibited maximum concentrations of approximately 400,000 ppm at the 4 to 6 foot interval.

2.7.2 Alkyl Phenol Settling Pond (APSS)

The APSS was targeted for investigation based on its historical use as a waste washwater sump. According to plant personnel, the APSS served as a collection point for washwater which collected in concrete troughs beneath the process area. The APSS was manually cleaned of settled solid wastes which were disposed off-site. This unit was sampled at the 4 to 6 foot and 9 to 11 foot intervals, and PCB isoconcentration maps are shown as Figures 23 and 24. As shown, the concentrations are several orders of magnitude less than the PDA. The higher concentrations have been detected at 4 to 6 feet BGS which corresponds to the nominal depth of this unit.

2.7.3 Secondary Settling Pond (SSP)

The SSP was operated from about 1960 to 1977. As described in the subsection above, waste washwater was directed to the APSS. However, during heavy rainfall the APSS unit could not handle the influent water and overflow was directed to the SSP by an underground terra-cotta pipe. Residual materials were carried to the SSP by this mechanism. Figures 25 and 26 show the PCB distribution in the SSP at the 4 to 6 and 9 to 11 foot intervals, respectively. The PCB levels in the SSP are in the range, but lower than the APSS, and many orders of magnitude less than the PDA. Like the other two AOCs, the highest concentration is observed at the 4 to 6 foot interval BGS.

2.7.4 Ground Water

Quarterly ground-water monitoring was conducted between June 1990 and June 1991. Twenty-six ground-water wells were used to monitor both the upper and lower water-bearing zones. The results identified several volatile and semivolatile compounds and PCBs at concentrations below levels of potential concern. In the lower water-bearing zone, elevated levels of chlorobenzene were identified; however, there is no known on-site source and the highest concentrations were measured in upgradient wells.

3.0 PROPOSED SITE-SPECIFIC CLEANUP STANDARDS

In the RI, it was concluded that PCBs in surface and subsurface soils were the primary constituents of potential concern at the site. However, natural site hydrogeologic conditions and the immobility of PCBs have prevented any significant migration in soils or ground water beyond the three AOCs. As discussed in Subsection 2.4, the surrounding neighborhood is expected to remain non-residential and deed restrictions can be employed to control future site use. Furthermore, Monsanto has agreed to certain pre-approved remedial objectives including hot spot removal of PCB-impacted soils and implementation of engineering controls. As a result of these natural and proposed remedial conditions, this FFS appropriately includes a petition for SCSs for PCBs in surface and subsurface soils. This petition will allow for a timely and appropriate remedy for the site utilizing the numeric standards described in this section.

The pertinent available cleanup standards include the Department's cleanup guidance levels, the USEPA guidelines under the Toxic Substance Control Act (TSCA), and a site-specific risk assessment from the RI Report which are described below. These potential cleanup standards or ARARs, in conjunction with the pre-approved remedial objectives have been used to determine appropriate media-specific SCSs which are described in Subsection 3.4. The proposed SCSs have been established in accordance with the formerly proposed clean-up standards, and by reviewing the human health and environmental risks, both short and long term, as described in the RI risk assessment. The SCSs presented, combined with a Department-approved remedial action, are designed to complete all of Monsanto's remedial obligations.

3.1 Department Guidance Levels

At the time of execution of the ACO, the Department did not have established cleanup standards. At that time, remediation decisions were made on a case-by-case basis, typically through the use of a site-specific risk assessment. In 1992, the Department issued proposed cleanup standards which were intended to provide adequate protection of human health and the environment, consistent treatment of all contaminated sites, and predictable regulatory decision-making. While uniform treatment is a goal, the Department had also recognized the need for a certain degree of site-specific flexibility. To account for this, the Department had included petitioning criteria and procedures for alternate cleanup standards in the proposed regulations.

The Department's formerly proposed standards for soils have, as of February 3, 1993, been formally withdrawn; but they are still used as guidance in the decision making process associated with site remediation. The current guidance levels for PCBs in residential surface soil, non-residential surface soil, and subsurface soil of 0.49, 2.0, and 100 parts per million (ppm), respectively, are included as ARARs in Table 2.

3.2 Existing Federal Cleanup Standards

The USEPA issued a PCB spill cleanup policy under TSCA, effective May 4, 1987, which sets out requirements for the cleanup of PCB spills ⁸. The agency regulates intentional and unintentional spills, leaks, and other uncontrolled discharges of PCBs at concentrations above 50 parts per million. Spills that occurred before this date are not directly regulated by this policy, and are to be decontaminated in accordance with the requirements established by the applicable USEPA regional office. The TSCA policy requires cleanup of PCBs to different levels depending upon spill location, the potential for exposure to residual PCBs remaining after cleanup, the concentration of the PCBs initially spilled, and the nature and size of the population potentially at risk from exposure.

The policy retains USEPA's flexibility to allow less stringent or alternative decontamination measures based upon site-specific considerations, but reserves its authority to impose more stringent cleanup requirements in cases where there are special risks of ingestion of PCBs through ground-water contamination. The TSCA ARARs applicable in this situation are the contaminated soil cleanup standards of 10 and 25 ppm, respectively, for non-restricted and restricted access areas. Since the Monsanto site is considered industrial, the 25 ppm restricted cleanup standard is applicable under TSCA. In fact, Monsanto's pre-approved remedial action of hot-spot removal with engineering and institutional controls will significantly exceed the TSCA requirements for restricted access areas. Table 2 presents the TSCA cleanup levels along with other ARARs for comparison.

3.3 Site-Specific Risk Assessment

A comprehensive site-specific risk assessment was performed for the site to evaluate the potential risks associated with impact to the soil, sediment, surface water, and ground water. This site-specific risk assessment focused on health protective standards and is detailed in the RI Report

as required by the ACO. The Department has notified Monsanto that certain specific exposure assumptions included in the site-specific risk assessment are not in accordance with current NJDEPE guidance.

Soil, ground water and air were evaluated as media that could receive and/or transport the chemicals of potential concern present at the site. Because the chemicals of potential concern were not detected above industrial background levels in ground water or air on any significant basis, only one medium, soil, was evaluated for this site. Furthermore, for purposes of the risk assessment, only surface soils were considered relevant. Three different potential exposure scenarios, based on both current use and future potential use of the site, were examined to determine the potential risks, if any, associated with the presence of chemicals in surface soils. The reasonably exposed individual (REI) and maximally exposed individual (MEI) exposure scenarios deal with current use of the site, and the construction scenario describes the likely future potential use of the site. The exposure scenarios were developed based on long term possible uses of the site and did not represent any known exposure during active operations.

The MEI exposure scenario represents an upper bound or worst case exposure. Using the assumptions for the MEI exposure scenario the target level for Aroclor 1260 which has been identified as carcinogenic is 26.5 ppm. This target level was most appropriate to evaluate upper bound or worst case exposure estimates for as long as previous site activities continued at the plant. In addition to considering the continuation of similar operations at the site, the site risk assessment also considered the possibility of discontinuing manufacturing functions and converting the land usage to other industrial activities or warehousing. For that to occur there would be limited construction activities over the short-term (up to 1 year). The future use scenario described the potential exposure during a construction phase at the site. Using the assumptions for the future use exposure scenario, the target level for Aroclor 1260 which has been identified as carcinogenic is 755 ppm. Use of this target level would be most appropriate if the current manufacturing activities ceased and construction of new manufacturing and/or warehousing was to occur. The non-residential surface soil target level of 26.5 ppm has been included in Table 2 for comparison.

Overall, this risk assessment demonstrated that the site did not present excessive carcinogenic or noncarcinogenic risk to employees. Future potential uses of the site were considered in the risk assessment, and both carcinogenic and noncarcinogenic risks estimated under the most likely future use scenario were well within acceptable limits. Although remediation of PCB “hot spots” would lower the projected incremental lifetime cancer risks associated with the MEI, the estimated potential risks, as applied to an occupational setting, do not warrant remediation. Furthermore, the risk assessment did not incorporate the engineering and institutional controls which would effectively eliminate all authorized access to former areas of impact. Remedial activities for this site were determined to be a matter of risk management and the risk assessment provided the necessary input for making these risk management decisions. As previously mentioned, the Department has notified Monsanto that certain specific exposure assumptions included in the site-specific risk assessment are not in accordance with current NJDEPE guidance.

3.4 Recommended Site-Specific Cleanup Standards

A summary of the applicable PCB levels in soils for the Department guidance levels, TSCA guidance levels, and the site-specific risk assessment findings are summarized in Table 2. The proposed SCSs included in this subsection are intended to allow for a timely and appropriate remediation of the three AOCs at the site. The full rationale for approval of these SCSs is provided in the formal petition in Section 4.0. Since the entire AP process area will be restricted by both engineering and institutional controls, the proposed surface soil (0-2 feet BGS) ACS of 25 ppm is warranted. This level is higher than the Department’s non-residential guidance value of 2 ppm, but that standard is derived without considering the use of engineering controls. This proposed surface soil SCS is consistent with TSCA levels and is lower than the site-specific risk assessment standards. Any low-level, residuals outside the immediate vicinity of the AOCs will be properly managed via engineering and institutional controls. The Department’s subsurface soil guidance value of 100 ppm is acceptable to Monsanto for the three defined AOCs and will form a partial basis for the subsurface SCS. A formal petition for SCSs for surface and subsurface soils is presented in the following section.

4.0 PETITION FOR SITE-SPECIFIC CLEANUP STANDARDS

Roux Associates, Inc. has developed this formal Petition for SCSs using the New Jersey Department of Environmental Protection and Energy's (Department) Proposed Cleanup Standards for Contaminated Sites published in the New Jersey Register on February 3, 1992 as a guideline. This section of the Focused Feasibility Study (FFS) addresses those requirements which were set forth in Subchapter 7, sections 7:26D-7.1 through 7:26D-7.4 pertaining to ACS petitioning procedures.

This petition has been maintained in the FFS to function as the basis for which SCSs will be approved for the site. The petition was originally incorporated into the FFS in accordance with correspondence from the Department dated September 16, 1992 which confirmed a prior verbal agreement with Monsanto that the submittal of an FFS and petition for ACSs would allow for the implementation of a timely and appropriate remedy for the site.

As outlined in Subchapter 7, section 7:26D-7.3 of the formerly proposed requirements, the following subsections of this report address each item in the petitioning procedure in the order of its appearance in the formerly proposed cleanup standards. This petition is submitted prior to the actual implementation of the remedial actions described later in the report as required in section (b) of the above referenced section.

4.1 Section (b) Requirements

This portion of the petition satisfies those requirements that had been listed in section 7:26D-7.3, section (b), Items 1 through 13.

Item 1. The name and address of the person responsible for submitting this petition is:

Monsanto Company
800 North Lindbergh Blvd.
St. Louis, Missouri 63167

Item 2. The name and address of the person responsible for conducting the cleanup of the site:

Monsanto Company
800 North Lindbergh Blvd.
St. Louis, Missouri 63167

Item 3. The names and addresses of all owners and occupants of the contaminated site are:

Monsanto Company
800 North Lindbergh Blvd.
St. Louis, Missouri 63167

Item 4. The location, street address and all tax block and lot numbers of the contaminated site, based on the most recent tax map are as follows:

Monsanto Company
Kearny Plant
Pennsylvania Avenue
Kearny, New Jersey 07032
Block # 284, Lot #s 49 and 50
Block # 289, Lot #s 19 and 20

Items 5 and 6. The environmental medium for which the petition applies is that of surface and subsurface soils. The current site-specific conditions regarding these and other media on the site have been summarized and are included in Section 2.0 of this FFS Report. The specific contaminant of concern for both surface and subsurface soils is PCBs. The concentrations of PCBs in the three identified areas of concern, are also described in Section 2.0 and shown on Figures 8 through 26. The areas and estimated yardages for the soil remediation activities for each of the three AOCs are shown on Figures 27 through 29.

Items 7 and 8. A petition for SCSs for surface and subsurface soils are appropriate since the proposed SCSs will accomplish the same degree of human health and environmental protection since the contaminant will not travel via the expected exposure pathways due to both site conditions and pre-approved remedial actions. Monsanto proposes to remediate soils as described in Sections 5.0 through 7.0 of this FFS report in a manner which will meet the Department's guidance levels for non-residential subsurface soils of 100 ppm in each AOC. The proposed remedial action agreed to between Monsanto and the Department involves hot spot removal of PCB-impacted soils combined with both engineering and institutional controls. These arguments are fully detailed below.

Exposure Pathways Are Not Present

The first technical basis for granting SCSs for both surface and subsurface soils is that the proposed SCSs will accomplish the same degree of human health and environmental protection

based upon evidence that the contaminant will not travel via the expected exposure pathways due to site-specific conditions. The site-specific conditions are such that the PCB contaminants present exhibit a high affinity for the organic soils present at the site. This has resulted in restricted contaminant migration throughout the site both horizontally and vertically. Previous site investigations which have included soil and ground-water sampling of the upper and lower water-bearing zone have consistently demonstrated the lack of migration of PCBs from the three areas of concern.

Pre-Approved Remedial Action

The second technical basis for granting SCSs involves a pre-approved remedial objective which will involve hot spot removal in conjunction with both engineering control of the contaminants and institutional control of the site. The site-specific soil and ground-water data support a Department determination that PCB contamination at the site in the surface and subsurface soils has not and will not result in a ground-water concentration of that contaminant above the applicable ground-water cleanup standard due to engineering controls which will be implemented at the site. The pre-approved remedial action includes hot-spot removal of surface and subsurface soils in the three identified AOCs; replacement of the penetrated peat layer using a clay barrier; encapsulation of the AP process area utilizing an asphalt cap (see Figure 30); and institutional controls including deed restrictions, restriction of property use, and maintenance of mitigative measures that will satisfy the requirements for a pre-approved remedial action.

Item 9. The numerical and narrative criteria for the SCS petition are fully described in Section 3.0 of this report and are summarized below:

- Surface soils - 25 ppm, with engineering and institutional controls for the former AP process area.
- Subsurface soils - 100 ppm throughout the soil column, including the peat layer in the PDA.

- Ground water - No action required due to the absence of impact above known industrial background conditions beyond the areas of concern. Monitoring of the ground water has been proposed and is described in Subsection 6.1.1.1 of this FFS.

Item 10. There is no evidence that the proposed SCSs would be inconsistent with other applicable environmental laws. Implementation of the selected remedial action will be conducted in accordance with applicable laws.

Item 11. Information regarding compliance with proposed public notice provisions is provided in Subsection 4.3.

Item 12. Department representatives have confirmed that an administrative checklist is not available nor necessary for this petition.

Item 13. The FFS includes all support information requested by the Department.

4.2 Section (c) Requirements

This FFS and the SCS petition will be submitted to the Department's case manager for review and approval.

4.3 Section (d) Requirements

Upon completion of this FFS, it is anticipated that the Department will develop a Decision Document for public review and comment. If directed by the Department, Monsanto will provide additional public notice of this petition by performing the following:

Item 1. Upon Department approval of the FFS and SCS petition, Monsanto agrees to mail a copy of the FFS, including all subsequent amendments to:

- (a) All owners and occupants of any part of the contaminated property;
- (b) All owners and occupants of all immediately adjacent properties;
- (c) The mayor or governing body, and environmental commission of all municipalities in which the contaminated site is located;
- (d) All local and county health officers/departments with jurisdiction over any part of the site;

- (e) Any other interested party who requests a copy of the petition in writing to either the department or the person conducting the cleanup.

Item 2. Monsanto also agrees to provide a newspaper notice, in two daily and one weekly newspapers distributed in the municipality of the contaminated site, which includes a summary of Items 1 through 11 of the petitioning procedures.

4.4 Section (e) Requirements

Monsanto understands that the Department may hold a public meeting following determination that there is or may be a significant degree of public interest in, or that a hearing can clarify one or more legal and factual issues on a petition for SCSs.

4.5 Section (f) Requirements

Monsanto understands that the person responsible for conducting the remediation shall be responsible for all scheduling and costs associated with any public meeting concerning the petition.

5.0 IDENTIFICATION AND PRE-SCREENING OF POTENTIAL REMEDIAL ACTION TECHNOLOGIES

The primary objective of the FFS process is to identify and evaluate remedial action alternatives that will accomplish pre-agreed upon site cleanup objectives. An emphasis for selecting remedial alternatives has been placed on readily implementable remedial technologies that have demonstrated the ability to meet applicable regulations and cleanup standards. To achieve this goal, the identification and pre-screening of potentially applicable remedial technologies incorporated the following four steps:

- Development of the remedial action objectives;
- Development of general response actions;
- Identification and pre-screening of applicable technologies;
- Selection of retained technologies and process options.

The following selection describes these steps in detail.

5.1 Remedial Action Objectives

The remedial action objectives presented herein are based on the results of the RI and consideration of human health and the environment. A number of specific remedial action objectives were developed to address the long-term goal of protecting human health and the environment, and meet the site specific goals of reducing the release of PCB-impacted soils into the air, surface water, and ground water. These objectives are as follow:

- Ground water - ground-water remedial action objectives have not been established as RI data indicate no compounds significantly exceed Department ground-water criteria for a Class II-A water supply. Concentration of compounds that do slightly exceed Department guidelines are representative of general ground-water conditions in the immediate area and do not pose any unacceptable risks to human health or the environment.

- Soils - Remedial action objectives have been established for PCB-impacted soils based on the identified ARARs and proposed SCSs. A SCS of 25 ppm PCBs has been petitioned for surface soils in conjunction with engineering and institutional controls. A SCS for subsurface soils of 100 ppm PCBs has been established which includes subsurface soils within and beneath the peat layer in the PDA.

5.2 General Response Actions

In this step, the general response actions that will satisfy the remedial action objectives are developed. These general response actions have been developed for the most probable sources of exposure to human health and the environment.

General response actions and associated technology groups identified for soils are:

| <u>Response Actions</u> | <u>Technology Group</u> |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • Institutional Controls | Deed Restrictions
Ground Water Use Restrictions
Monitoring
Physical (Access) Restrictions |
| • Soil Containment Actions | Grading
Dust Control
Capping
Barriers |
| • Soil Excavation and Treatment/
Disposal Actions | Excavation
On-Site, Off-Site Landfilling
On-Site Physical Treatment
On-Site Chemical Treatment
On-Site, Off-Site Biological Treatment
On-Site, Off-Site Thermal Treatment |
| • In-situ Treatment Actions | Physical Treatment
Chemical Treatment
Biological Treatment
Thermal Treatment |

5.3 Identification of Potential Remedial Technologies

In this step, potentially applicable technologies and process options are identified and then subsequently reduced by screening (evaluating) the options. Technologies and process options are identified with particular consideration given to remediating the PCB-impacted soils identified during the RI.

The purpose of the technology screening process is to select a limited number of promising technologies for consideration in assembling remedial action alternatives. A decision is made whether to retain an identified technology or process option for use in developing alternatives or to eliminate it from further consideration. Criteria used for screening of the options include effectiveness and implementability. Cost is not used as a criteria at this time.

Effectiveness is the primary criterion used to screen options at this point. Effectiveness is evaluated considering engineering reliability, i.e., the ability of the technology to meet the remedial action objectives associated with protection of human health and the environment. Implementability is evaluated considering the technical and institutional feasibility of implementing the technology. Technical implementability considers a range of factors relevant to obtaining, installing, and using a particular technology. Some remedial technologies are proven and readily available, while others are in the research and development stages. Insufficiently developed technologies are generally screened out. Site conditions must be compatible with the feasible range of a given technology's capability, considering for example, depth to bedrock, depth to ground water, space requirements, etc. Institutional implementability considers a range of factors relevant to the testing, review, approval, or permitting of a particular technology.

5.4 Technology Screening

Potentially applicable remedial action technologies that have been identified for the Site are presented in Figures 31A and 31B. The figures briefly describe the technologies, indicate the applicability of each technology, and present the remedial technologies retained for further consideration.

The rationale for the selection of potentially applicable technologies considered for the site is summarized below.

5.4.1 Institutional Controls

Institutional measures include legal and physical controls that are developed to limit potential exposure, but do not address treatment of impacted materials. As a result, institutional measures may be used in conjunction with other alternatives as part of an overall site remedy. Typical institutional measures include deed restrictions, physical access restrictions, and ground-water monitoring.

Deed restrictions involve a legal annotation on the site's property deed in order that prospective buyers would be alerted to the presence of hazardous substances. Additionally, property use and well installation can be restricted. Deed restriction will be retained for further consideration.

Physical restrictions include installation of perimeter fencing to ensure site security. This would reduce the potential for exposure due to direct contact with the PCB-impacted soils. This alternative will be retained for further development.

Monitoring is utilized to assess remediation effectiveness and to confirm the absence of chemical compound migration off site. Ground water may be monitored through periodic sampling and analysis to track potential migration of contaminants off-site. Remedial measures could be triggered if detected concentrations exceed the established action levels. Monitoring will be retained for further development.

5.4.2 Soil Containment

Several methods of containment were considered for alternative development, including capping and barriers. These technologies are discussed in the following sections.

5.4.2.1 Capping

Capping is a method used to cover waste materials to prevent their release to either the air or ground water. The design of a cap may conform to the performance standards in 40 CFR 264.310 [Resource, Conservation and Recovery Act (RCRA) landfill closure requirements], or

New Jersey solid waste regulations. These standards include minimum liquid migration through the waste, low cover maintenance requirements, sufficient site drainage, high resistance to damage by settling or subsidence, and a permeability lower than or equal to the underlying liner system or natural soils.

There are a variety of cap designs and capping materials available. Many cap designs are multi-layered to conform with the above-mentioned design standards; however, single layered designs are also used for special purposes. The design of multi-layered caps generally adopts a three-layered system consisting of an upper vegetative layer, underlain by a drainage layer over a low permeability layer. The vegetative layer consists of topsoil; the drainage layer is composed of sand; and the low permeability layer is formed by a combined synthetic and soil liner system. The primary function of a cap is to divert surface water infiltration away from the underlying waste materials. More limited caps involving installation of a single layer impervious material, such as asphalt, can also be used to effectively limit access and prevent infiltration of water to subsurface soils. The cap design and selection of capping materials is influenced by specific factors, such as local availability and costs of the capping materials, the nature of the waste being covered, local climate and hydrogeology, and projected future use of the site.

The main disadvantages of capping are the potential need for long-term maintenance and uncertain design life. Caps also need to be periodically inspected for settlement, ponding of liquids, erosion, and naturally occurring invasion by deep-rooted vegetation. However, asphalt caps will be retained for alternative development.

5.4.2.2 Barriers

Horizontal and vertical barriers are containment options considered for the site. At this Site, the existence of a peat/clay confining unit precludes the need to implement a horizontal subsurface barrier in the APSS and SSP areas, however, the removal of the peat/clay confining unit in the PDA will require the installation of a horizontal barrier as a replacement to this natural confining unit. Therefore, horizontal clay barriers will be retained for alternative development. Vertical barriers are used to control ground-water migration. Vertical barriers include slurry walls, grout curtains, and sheet piling. While there is no current indication for a need to control the migration of contamination in ground water, vertical barriers may be used

as part of a soil removal alternative. As a result, only vertical barriers comprised of sheet piling will be retained for alternative development.

5.4.3 Soil Removal

Excavation of PCB-impacted soils from hot-spot areas would be effective as a source control measure and would eliminate or reduce further contaminant migration associated with the three areas of concern. This technology is only considered as a remedial action when used in conjunction with one of the options described in following sections for treatment (on-site or off-site) and disposal (on-site or off-site). Therefore, this technology will be retained for further consideration as part of other treatment or disposal options.

5.4.4 Soil Disposal

Disposal of excavated soils would be implemented off-site in an existing TSCA-permitted landfill. Off-site disposal involves excavation of wastes and soils containing compounds in excess of the target criteria (as described in Section 5.1) and transportation to an approved TSCA-permitted disposal facility. Given the relatively small volumes of PCB-impacted materials and its waste classification as non-RCRA hazardous, the off-site disposal process option is retained. A summary of waste classification sampling conducted prior to the FFS is attached as Table 3.

On-site disposal of excavated soils necessitates the construction of a secure TSCA landfill at the site. Elements of such a site may also be required to meet the applicable RCRA requirements and regulations (40 CFR 264.300 through 264.317), as well as state requirements. This process option is not retained as it is typically only applicable at large volume sites, and land disposal restrictions may prohibit its implementation.

5.4.5 In-Situ Soils Treatment

A variety of process options exist for treating the PCB-impacted soils in-situ. These processes either degrade, remove, or immobilize contaminants. They can be classified as physical, chemical, and biological and are detailed below.

5.4.5.1 Physical In-Situ Treatment

Of the physical in-situ treatment methods, only vitrification and fixation/solidification have been demonstrated as potentially effective processes for PCB-impacted soils given proper site conditions.

In-situ vitrification is accomplished by installing electrodes in boreholes around an area, applying a high voltage and heating the soil/waste mass as a result of the electrical resistance of the mass. Soils are melted at the high temperatures developed. A hood is erected over the area to be vitrified to collect off-gases. Vitrification results in organic contaminant destruction and melting of the heated mass, which then cools to a glassy solid, immobilizing residual contaminants. This technology is best applied where very high temperatures are required for contaminant destruction, and where the glassy solid product is beneficial in immobilizing inorganic contaminants that are not destroyed during processing. The process is relatively expensive, energy intensive and complicated. The shallow ground-water table at the site would make this process technically difficult to achieve. Therefore, vitrification will not be retained.

Fixation/Solidification is a physical process that immobilizes constituents in impacted soils, thereby significantly reducing the potential for leaching. The beneficial results of this treatment are obtained primarily through the production of a solid, impermeable matrix with high structural integrity. Various techniques are used to solidify the solid matrix. The first of these is chemical sorption, which eliminates all free liquid by adding a hydration reagent such as quicklime (CaO). Another solidification process uses lime and fly-ash to form a low-strength cement. The fine divided, non-crystalline silica in the fly-ash combines with the calcium in the lime to produce a concrete matrix which effectively entraps the waste. The third technique combines Portland cement, fly-ash or other pozzolanic materials to produce a structurally stable waste concrete composite. In this process, containment is realized by microencapsulation of the waste within the concrete matrix. For specific application requirements, soluble silicates may be added to accelerate hardening and containment of metals.

Bench scale and pilot testing may be necessary to demonstrate the effectiveness of immobilizing PCBs, however, this technology will be retained for alternative development.

5.4.5.2 Chemical In-Situ Treatment

Available chemical treatment methods for in-situ treatment of PCBs in unsaturated soils are limited. The dehalogenation/mineralization reactions obtained using alkaline metals, catalysts, and hydrogen peroxide may be achievable, but aqueous feed of these chemicals in situ over the desired areas would be difficult. Treatment would therefore be limited to areas where effective solution distribution could be achieved. The ability to obtain and control the desired reaction in a soil matrix would have to be demonstrated. The implementability limitations and uncertainties regarding effectiveness of this technology are significant, therefore, the technology will not be retained.

5.4.5.3 Biological In-Situ Treatment

Bioreclamation of contaminated soils would require the addition of nutrients and an external carbon source. Oxygen, nutrients, and surfactants are typically delivered to soils through injection wells or an infiltration system via ground-water recirculation. The application of aqueous solutions over the three distinct areas at the site is not practical, and the process would be difficult to control in-situ. In addition, biological degradation of PCBs has not been widely demonstrated. This technology will, therefore, not be retained for alternative development.

5.4.6 Direct Soils Treatment On-Site

On-site treatment technologies considered for alternative development can be divided into four categories:

- Biological Treatment
- Chemical Treatment
- Physical Treatment
- Thermal Treatment

Implementation of each of these technologies would be preceded by excavation activities, as described in Section 5.4.3.

5.4.6.1 Biological Treatment

Biological treatment is potentially viable for removal of PCB contaminants, and can be more readily controlled above ground. The process utilizes a method for acclimating a naturally

occurring species of microbes which has an ability to degrade PCBs. The microbes metabolize PCBs by attacking the chlorine atoms, ultimately reducing the molecule to cell protoplasm, water, carbon dioxide or methane, and salts. Enzymes and catalysts are added to enhance the process. Degradation of the compounds of concern would have to be demonstrated, however, and the use of slurry-type reactors would produce an aqueous waste stream requiring treatment and disposal. Biological treatment will thus not be retained for the development of alternatives.

5.4.6.2 Chemical Treatment

Of the chemical treatment methods considered, dechlorination has demonstrated full-scale effectiveness for treatment of PCB-impacted soils. Dechlorination is a process that involves the addition of an alkaline metal and polyethylene glycol (PEG) reagent to remove chlorine atoms from chlorinated organic compounds. Dechlorination processes have been commercially developed primarily for the treatment of PCBs in electric transformer fluids. However, the process may be applicable to soils contaminated with PCBs, dioxins, pesticides, and other chlorinated hydrocarbons. Residues from the process include chloride salts, polymers, and occasionally heavy metals. The heavy metals may require treatment before disposal.

The alkaline metal and PEG reagent are air and water sensitive. Thus, soils to be treated would need to be dewatered prior to treatment. Bench-scale and pilot testing would be necessary to demonstrate the effectiveness of the process.

Dechlorination could be applicable to the PCB-impacted areas on-site; however, the testing required to demonstrate the process and its relative high cost make other equally effective options more attractive. Therefore, the technology will not be retained for alternative development.

5.4.6.3 Physical Treatment

The demonstrated on-site physical treatment process options for PCB-impacted soils are limited to fixation/solidification which was previously described as an in-situ process in section 5.4.5.1. Because a large percentage of the PCB-impacted materials are relatively shallow, in-situ methods would be favored over ex-situ physical treatment. On the basis of equally effective options that are more attractive, this technology will not be retained.

5.4.6.4 Thermal Treatment

Thermal desorption is an ex-situ means to physically separate volatile and some semivolatile contaminants from soil, sediments, sludges, and filter cakes. For wastes containing up to 10% organics or less, thermal desorption can be used alone for site remediation. It also may find applications in conjunction with other technologies or be appropriate to specific operable units at a site.

Thermal desorption has been proven effective in treating contaminated soils, sludges, and various filter cakes. Chemical contaminants for which bench-scale through full-scale treatment data exist include primarily volatile organic compounds (VOCs), semivolatiles, and some higher boiling point compounds. The technology is not effective in separating inorganics from the contaminated medium. Volatile metals, however, may be removed by higher temperature thermal desorption systems. Following separation from the soil matrix, the contaminants removed require treatment or destruction prior to discharge.

Site-specific treatability studies will generally be necessary to document the applicability and performance of a thermal desorption system. However, this is a rapidly developing technology and will be retained for alternative selection.

5.4.7 Soil Treatment Off-Site

Off-site treatment methods considered for alternative development are thermal destruction in an approved RCRA-permitted incinerator. Most commercially available incinerator facilities are rotary kiln type. Rotary kiln incinerators are cylindrical, refractory-lined shells. They are fueled by natural gas, oil, or pulverized coal. Most of the heating of the waste is due to heat transfer with the combustion gases and the walls of the kiln.

Wastes are injected into the kiln at the higher end and are passed through the combustion zone as the kiln rotates. The rotation creates turbulence and improves combustion. Rotary kilns often employ afterburners to ensure complete combustion. Most kilns are equipped with wet scrubber emission controls.

The residence time and temperature depend upon combustion characteristics of the waste. Residence times can range from a few seconds to an hour or more for bulk solids. Combustion temperatures range from 1500 degrees Fahrenheit to 3000 degrees Fahrenheit. Rotary kiln incineration is a proven but costly process for PCB-impacted soils; however, it will be retained for alternative development.

5.5 Process Options Passing Technology Screening

Considering the site and contaminant characteristics, and the remedial action objectives, the following process options were retained for consideration in development of alternatives:

| <u>Response Action</u> | <u>Remedial Technology</u> | <u>Process Option</u> |
|-------------------------------|----------------------------------------------------------------------------------------|---------------------------------|
| Institutional Controls | Deed Restriction
Ground Water Use Restriction
Monitoring
Physical Restriction | |
| Soil Containment | Capping
Vertical Barriers
Horizontal Barriers | Asphalt
Sheet Piling
Clay |
| Soil Excavation and Disposal | Excavation
Removal of Impacted Soils | TSCA Landfill |
| Soil Excavation and Treatment | Excavation
Off-Site Thermal
On-Site Thermal | Incineration
Desorption |
| In-Situ Soil Treatment | Physical | Fixation/Solidification |

6.0 DEVELOPMENT AND SCREENING OF PRE-APPROVED REMEDIAL OBJECTIVE OPTIONS AND PROPOSED REMEDIAL ACTION SELECTION

In this section, remedial action alternatives which meet pre-approved objectives are developed to address specific media requirements. This is done by combining the potentially applicable technologies and process options that were identified in the previous section. Guidance for developing alternatives is provided in the ACO, Appendix E and requires that only the most environmentally sound remedial action alternatives be included which, in a timely manner, will:

1. Cleanup pollution at the site, emanating from the site, or which has emanated from the site.
2. Achieve and maintain applicable air, soil, surface-water and ground-water quality standards (e.g., N.J.A.C. 7:14A-1 *et seq.*, 7:9-4, 7:9-6), and applicable guidelines established by the Department, site-specific concentration limits proposed by Monsanto or return the area to background conditions.
3. Remedy damage to and provide adequate protection of human health and the environment.

The remedial technologies remaining from the technology screening of Section 5.0 were assembled into a list of potential pre-approved remedial action alternatives that protect human health and the environment and encompass a range of appropriate waste management options. Alternatives were primarily assembled to address the impact of PCB compounds found in site soils, but considerations were given for long-term protection of site ground water as well.

From the remaining general response actions and remedial technologies listed in Section 5.5, four alternatives, whose general response actions involve treatment and containment options, were selected for further consideration. These alternatives are listed in Table 4.

6.1 Descriptions of Remedial Action Alternatives

In this section, the remedial action alternatives presented in Table 4 are fully described and subjected to a preliminary evaluation. Defined alternatives are evaluated against the short- and

long-term aspects of three broad criteria: effectiveness, implementability, and cost. These alternatives will undergo a comparative analysis in Section 6.2.

Factors considered within the effectiveness criteria include the ability of the alternative to protect human health and the environment, reduce the toxicity, mobility, or volume of the hazardous substances present at the site, as well as the reliability of the alternative. Effectiveness is assessed by considering the time until protection is achieved, and considering long-term management needs.

The implementability of each alternative is assessed by considering the overall technical and administrative feasibility of constructing, operating, and maintaining the remedial action alternative. This assessment includes addressing environmental and human health impacts during implementation, permitting requirements, and the need for any significant on-site or off-site structure and facilities.

Cost is considered when comparing alternatives providing similar protection. Readily available costs figures were used where appropriate. Capital, but not long-term O&M, costs were considered.

6.1.1 Alternative 1: Excavation, Off-Site Landfilling of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions

6.1.1.1 Description

This alternative would involve removal and disposal of hot-spot PCB-impacted soils at an off-site TSCA-permitted facility. Figure 32 depicts the conceptual soil removal operations. To accomplish this, the predefined areas to be excavated would initially be isolated using sheet piling. These predefined areas, as determined during the RI and meetings between the Department and Monsanto, are shown on Figures 27, 28 and 29. Dewatering would be utilized to reduce tonnage of impacted soils to be disposed. Sheet-piling will permit safe excavation of soils within the predefined areas. An on-site granular activated carbon treatment system would be installed to treat the water prior to discharge to surface water, ground water or a POTW. Alternate ground-water treatment may need to be evaluated.

After the hot-spot PCB-impacted material is excavated, a man-made horizontal clay barrier of equal or lesser permeability would be installed where the previous peat layer existed in the PDA during backfilling operations. After the excavated soil is disposed of, the entire process area will be capped with asphalt to minimize any potential for exposure and migration of any residual materials. Asphalt is selected because of its ability to minimize infiltration and also provide long-term service with relatively low maintenance requirements. A detail drawing of the asphalt cap is provided in Figure 33, and a plan view of the areal extent of capping is provided in Figure 30.

The final component of this alternative is deed restrictions and ground-water monitoring as described below.

Deed restrictions involve nominal legal actions and provide for a permanent record of land use restrictions. As part of this measure the present property owners of the land within the site boundaries would be required to restrict or properly manage any future actions which would disturb the subsurface soils, including construction of roads, underground utilities, or wells. As the deed is legally annotated, any future property owners would be alerted of potential requirements or hazards.

The long-term ground-water monitoring incorporates periodic sampling and analysis of pre-determined locations which would adequately track off-site migration of impacted ground water. The sampling method will adhere to the procedures outlined in the Department's May 1992 Field Sampling Procedures Manual. The samples will be analyzed for individual PCB congeners utilizing USEPA Method 8080. At a minimum, the data will be reported in a manner consistent with the New Jersey Reduced Deliverables Format. In addition, the reporting format for the ground-water monitoring will include at least 25% CLP I, NJDEPE deliverables. The practical quantitation limit (PQL) of the proposed analytical method for PCBs will be 0.5 parts per billion. However, the intent of the monitoring program is to be protective of both ground water and surface water. For this site, the following monitoring well array would be used for analytical sampling points:

- Upgradient wells 10S and 10D

- Downgradient wells 8S, 8D, 13S, 13D, 14S and 14D

A site plan showing the areas of concern and proposed compliance and background well locations is provided in Figure 34. One ground-water sampling event is to be conducted immediately before implementation of remedial activities. Since hot spot removal, barriers, and capping containment measures are part of this alternative, semi-annual ground-water sampling for PCBs will be performed for the first three years followed by two years of annual sampling. If a sustained level above the ground-water quality standards and also exceeding background levels is realized, the Department may establish a need for a corrective action plan.

6.1.1.2 Protection of Human Health and the Environment

This alternative would achieve the three primary goals of the ACO, Appendix E. The potential long-term exposure to subsurface materials will be restricted by the asphalt cap. The imposition of deed restrictions is another effective means of further reducing the incidence of future soil disturbance from utility excavation or well installation.

As the hot-spot removal alternative is eliminating the highest PCB-impacted soils found, risk to the local community from future exposure is significantly minimized. On-site workers would be required to wear protective health and safety equipment to prevent short-term health effects during any scheduled excavation and handling of the PCB-impacted material.

6.1.1.3 Engineering Feasibility and Reliability

The excavation equipment and off-site facilities required for implementing this alternative are readily available. Further, this landfilling alternative is almost immediately implementable requiring only waste approval and no bench scale or pilot scale testing. Some ex-situ stabilization agents may be mixed in to ensure there is no free standing water upon arrival at the landfill. These stabilizing agents are also commercially available.

Deed restrictions can be readily implemented by the site owner. Access restrictions, monitoring, and cap maintenance activities are all services which are commercially available.

The most lengthy process requirement of implementing this alternative would likely be the permitting necessary to discharge waters generated during dewatering and treated via GAC. As a result, off-site treatment of any water generated at a permitted facility may be considered.

6.1.2 Alternative 2: Excavation, Off-Site Incineration of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions

6.1.2.1 Description

This alternative contains the exact components of Alternative #1 with the exception of incorporating off-site incineration of the PCB-impacted soils in a permitted facility. As the volume of PCB-impacted soils to be treated is identical as in Alternative #1, this alternative will require the same levels of on-site engineering and institutional controls including capping and deed restrictions.

6.1.2.2 Protection of Human Health and the Environment

This alternative would meet the identical level of on-site protection of human health and the environment as did Alternative #1. In this case, however, PCBs are destroyed, thus, achieving maximum reduction in the toxicity and volume of hazardous substances. However, air emission scrubbers required to reduce air pollution potential will generate waste effluent and particulates that must be properly treated and disposed.

6.1.2.3 Engineering Feasibility and Reliability

The excavation equipment and off-site facilities required for this alternative are commercially available. A test burn of the PCB-impacted soil may be required to demonstrate compliance with incineration performance standards, especially related to the emissions control systems, and characteristics of the remaining incinerator ash which is likely to be non-hazardous after stabilization.

6.1.3 Alternative 3: Excavation, On-Site Thermal Desorption of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions

6.1.3.1 Description

This alternative incorporates all of the key components as the first two alternatives with the exception that the PCB-impacted soils are treated on-site by a mobile unit. Several mobile

thermal units are commercially available for removal of PCBs from soils via desorption and collection of PCB substances. Again, the volume of PCB-impacted soils to be treated is identical to Alternatives #1 and #2, and the same ancillary engineering controls for dewatering, capping and deed restrictions will be utilized.

6.1.3.2 Protection of Human Health and the Environment

This alternative would achieve maximum destruction of PCB constituents and thus the toxicity, mobility, and volume of hazardous substances would be significantly reduced. However, because of the longer implementation periods for this process, on-site workers would be at risk of potential exposures for a much longer period than Alternatives #1 or #2. The long-term protection of human health and the environment around the site would be identical to the two previous alternatives.

6.1.3.3 Engineering Feasibility and Reliability

Mobile thermal desorption units are commercially available to reduce or eliminate PCB concentrations in soils, waste, and water. A mobile thermal treatment system requires several tractor-trailer units to transport the necessary equipment to the site. The capacity of commercially available mobile units varies depending on size and the type of unit that is utilized. Utilities needed for the operation for a mobile unit include electric power, auxiliary fuel, and clean water. Air emission scrubbers required to reduce air pollution potential will generate waste effluent and particulates that must be properly treated and disposed. The efficiency and ability of the mobile unit will have to be tested to determine its ability to treat the PCB impacted soils to target levels. Securing the necessary permits for the air emissions is typically a lengthy process.

6.1.4 Alternative 4: In-situ Solidification of PCB-Impacted Soils, Asphalt Cap, and Deed Restrictions

6.1.4.1 Description

This alternative involves an in-situ solidification process which results in significantly different components than the first three ex-situ alternatives. While the same volume of PCB-impacted materials is treated in this process as in the three previous alternatives, sheet piling, excavation

and dewatering are not needed. The capping and deed restrictions as previously described would still be utilized as part of this alternative.

6.1.4.2 Protection of Human Health and the Environment

This alternative provides extensive immobilization and encapsulation of PCB-impacted soils, but does not reduce the long-term toxicity or volume of hazardous substances. However, the in-situ process allows for significantly more vapor and dust control capacity than the ex-situ alternatives and thereby potentially reducing exposures to on-site workers.

6.1.4.3 Engineering Feasibility and Reliability

There are several commercial vendors that provide in-situ solidification services. Bench scale testing is required to evaluate the optimum mix ratios for variety of solidification agents including fly-ash, kiln dust, portland cement, and any necessary additives. In the final application, the desired mixing agents can be added to the in-situ soils as dry or fluid treatment.

In-situ solidification has been demonstrated effectively on PCB-impacted materials, and has been shown to conform with applicable regulations and treatment standards at various sites.

6.2 Proposed Remedial Action Alternative Selection

This section presents an overall comparison of the four remedial alternatives in order that a proposed remedy can be selected. The format of this analysis is to identify the merits of each alternative relative to one another so that direct comparisons can be identified and balanced objectively.

6.2.1 Overall Protection of Human Health and the Environment

Alternatives #1 through #3 all involve hot-spot removal of the highest PCB-impacted material, and all provide encapsulation, vertical and horizontal barriers, deed restrictions, and monitoring. As a result, all provide identical long-term protection of human health and the environment in the immediate vicinity of the site. Alternative #4 utilized hot-spot immobilization in lieu of hot-spot removal of PCB-impacted soils.

Considering reduction of toxicity and volume, Alternatives #2 and #3 receive higher marks due to their thermal treatment processes, than does Alternative #4 which relies on immobilization and encapsulation via physical processes. Alternative #1 equally eliminates potential site exposures and can be implemented in a more timely manner than Alternatives #2, 3, or 4. All alternatives effectively mitigate future risk associated with exposure pathways for on-site soils and ground water.

6.2.2 Overall Engineering Feasibility and Reliability

All four alternatives have been demonstrated as feasible and reliable. However, on-site Alternatives #4 (in-situ solidification) and Alternative #3 (on-site thermal desorption) may require bench pilot study testing to ensure the technology is effective at this specific site. Factors that could adversely affect these technologies include: moisture content, clay content, and debris. Because of these initial testing requirements for on-site technologies, the off-site alternatives, Alternative #1 (landfilling) and Alternative #2 (incineration), could be more readily implemented in shorter time periods. The approval process for Alternative #1 is typically more rapid than any of the other alternatives.

6.2.3 Overall Cost Comparison

Cost estimates for each of the four alternatives have been developed and are presented in Table 4. The costs range from to \$1.5 MM to \$12.0 MM and are directly proportional to the complexity of implementing the alternative. Alternative #4 (in-situ solidification) has the lowest costs as sheet-piling, excavation, and dewatering/treatment are not involved. Alternative #1, off-site landfilling, is the next lowest cost and is slightly lower than Alternative #3 (on-site desorption). Alternative #2 (off-site thermal incineration) is significantly higher in cost.

6.2.4 Selection of Proposed Remedial Alternative

On the basis of the overall comparative evaluation, the order of selection of proposed remedial alternatives is as follows:

Preferred Selection: Alternative #1 - off-site landfill

Second Selection: Alternative #4 - in-situ solidification

Though Alternative #1 is not the lowest cost option, it is the preferred remedy for this site due to advantages in engineering feasibility and implementability.

- **Ease of implementability.** As no bench or pilot scale testing is required, this option can be immediately implemented.
- **Simple construction activities.** This option utilizes simple construction techniques that can be well controlled in the field, and executed in a timely manner.
- **Off-site landfilling is an appropriate technology.** Off-site landfilling is considered appropriate in this case because the volume of these impacted soils is relatively small, the soils are not RCRA-hazardous as determined during waste classification sampling, and PCBs have a high affinity for soils and therefore do not readily leach into aqueous phase, and as a result are relative immobile.

Alternative #4, in-situ solidification, has significant advantages including minimal construction requirements (no need for sheetpiling or dewatering), minimal potential exposures to on-site workers, and low cost. Its main disadvantage in this case is the time needed for bench-scale testing to determine the appropriate stabilizing agents and mix ratios to be utilized and to ensure there is no long-term chemical degradation of the solidified matrix. Given the only negative is the ability to proceed in a timely manner, this alternative is ranked as preferred, but still second to the Alternative #1 option.

Alternatives #2 and #3 are not selected as proposed remedial alternatives due to strong negative factors in one or more evaluation areas. Alternative #3 has the most significant unknowns in implementability and effectiveness due to the required pilot scale testing, potential lengthy air permitting process, and unfavorable cost effectiveness due to the relatively small quantities of PCB-impacted materials to be treated. Alternative #2 is not selected because approvals are more lengthy, it has a significantly higher cost compared to Alternatives providing similar protection, and significant quantities of waste residuals are generated (particulate generated in the air emission scrubbers and incineration ash) that must be subsequently treated and disposed.

7.0 CONCEPTUAL DESIGN

In this section of the FFS, the conceptual design for the primary remedial action alternative selected in Section 6.0 is presented in further detail. Guidance in writing this portion of the FFS has been taken from the ACO, Appendix E, Part II(G)3. The conceptual design discussed below represents Monsanto's current proposed engineering and institutional control implementation plans. Specific technical details of this conceptual design will be submitted as a Remedial Action Plan (RAP) subsequent to the approval of this FFS. The basic components of the RAP are outlined in Section 9.0.

7.1 Engineering and Hydrogeologic Approach

As discussed in previous sections of this report, hot-spot removal of the three separate areas of concern (AOC) will be performed. In order to conduct this task, certain tasks must be performed to facilitate the removal of contaminated soils from the subsurface. The conceptual design of each of these tasks are identified below.

Sheet-Piling

In order to safely and effectively conduct removal operations, steel sheet-piling will be installed as a vertical barrier around the perimeter of each AOC to a maximum depth of approximately 40 feet BGS in the PDA. The areas to be enclosed in each AOC are shown on Figures 27, 28 and 29. The sheet-piling will be vibrated in place utilizing a hydraulic vibrator held by a crane. The sheeting will be installed in a tongue and groove style to form a complete impermeable barrier around the perimeter of each area of concern. The sheet-piling will isolate each AOC from horizontal ground-water flow to allow effective dewatering operations to be conducted which are necessary to facilitate soils removal. Secondly, the sheet-piling will be left in place following removal and backfilling operations to continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within soils. By installing the sheet-piling to a depth of approximately 40 feet BGS in the PDA, the barrier will tie into a deeper clay unit found beneath the lower water-bearing zone on the site thus providing for maximum stability and containment. Figure 32 shows a vertical cross section of the sheet-piling in place as well as the aboveground conceptual approach for the PDA.

Dewatering

Following the installation of sheet-piling in all three AOC's, dewatering equipment will be installed in each AOC utilizing either a dewatering sump or well point system. Each AOC will be dewatered to below the proposed depth of excavation, and dewatering operations will continue as necessary to establish hydraulic control during removal operations. Pore volumes for each AOC have been estimated to size the temporary holding tanks necessary to stage water generated during dewatering operations prior to treatment.

Water Treatment

As a primary option, all waters generated from dewatering operations will be pumped via a second pumping system from the AOC's to holding tanks, through a treatment system to a permitted discharge point. The treatment system will consist of filtration followed by granular activated carbon treatment. The final design of this treatment system will be included in the RAP submitted following approval of this FFS. All carbon used to polish ground water prior to discharge will either be incinerated or disposed of at a permitted disposal facility following completion of on-site operations.

Because of potential time delays associated with discharge permitting, a second option which may be utilized in dealing with evacuated ground water generated during dewatering operations involves off-site disposal. This option will be further evaluated and finalized in the RAP.

Excavation

Following the installation of the vertical barrier and dewatering systems, excavation of the three AOC's will commence using a track or clam-shell excavator capable of reaching a depth of approximately 24 feet BGS from the side of the largest excavation (the PDA). The excavator will remove the soils from each AOC as identified earlier in this report, and place them in a temporary holding tank. The tank will be pre-assembled prior to removal operations commencing. The tank will serve three purposes including: the draining of residual moisture left in previously saturated soils via gravity drainage through either a false bottom/underdrain system or a sloped floor design with a filter fabric retaining wall to hold back sediment; containment of excavated soils during the loading and transportation operation; and as a stabilizing tank, if required, whereby soils will be stabilized using a stabilizer such as quicklime

or fly-ash prior to transport to an off-site permitted TSCA landfill. All decanted waters generated during the draining process will be collected and pumped to a holding tank prior to being treated using the same method employed for waters generated during dewatering operations.

Removal activities will be conducted in the three AOC's, as previously discussed, to a maximum depth of 24 feet BGS in the PDA and 9 feet BGS in the APSS and SSP. Volume calculations for removal of soils have been estimated at this depth scenario and are presented as Figures 27, 28 and 29.

Post-excavation bottom sampling and field screening will be conducted during the excavation phase to assess post-remedial activity results. Field screening tools may include the use of immunoassay test kits for PCBs to provide immediate results concerning vertical delineation of PCB contaminated soils above the 100 ppm subsurface cleanup standard. Upon determination that contaminated soils above 100 ppm have been remediated, post-excavation soil samples will be collected and tested for total PCBs using EPA Method 8080. At a minimum, post-excavation soil samples will be reported in a NJDEPE reduced deliverables format. In addition, 25% of the post-excavation soil samples will be reported in a NJDEPE CLP I deliverables package. These CLP I results will be validated by Monsanto and a report will be submitted to the NJDEPE along with the analytical results. Samples will be collected from the bottom of each excavation only, due to the fact that permanent vertical barriers will be installed and do not allow for sidewall sampling. The number of samples which will be collected from each AOC will be based, using the formerly proposed regulations as a guideline, on one bottom sample for every 900 square feet for each excavation or a minimum of two samples. Therefore, the total number of post-excavation samples that will be collected are as follows:

- PDA Area - based on 5,360 total square feet for the outer target area boundary, a total of 6 post-excavation samples will be collected including 4 from the upper tier, and 2 from the lower tier.
- APSS Area - based on 2,120 total square feet, a total of 3 post-excavation samples will be collected.

- SSP Area - based on 714 total square feet, 2 post-excavation sample will be collected.

Each post-excavation soil sample will be made up of a maximum of three composite sampling locations. Additional details regarding the exact locations of each post-excavation sample within each AOC will be finalized and included in the Remedial Action Plan.

Following the removal of soils from each AOC, the areas will be immediately backfilled using clean backfill material brought on-site specifically for this purpose. In the PDA, where the existing peat layer will have been penetrated, a low permeability material will be used to reconstruct the less permeable peat layer where removed during backfilling operations. The areas will be compacted in lifts as required, and prepared for encapsulation following the decontamination and demobilization of all equipment from the process areas utilized during site operations. The sheet-piling will be cut off 1 to 2 feet BGS in preparation for capping. The location of each AOC's excavation area will be surveyed relative to a common permanent datum on-site to provide a permanent record for the deed annotation.

Encapsulation

Following the demobilization of all equipment from the process areas, the area will be prepared for encapsulation utilizing an asphalt cap. A cross section of the proposed cap design is presented in Figure 33. The total area to be encapsulated is shown on a site plan attached as Figure 30.

7.2 Implementation Schedule

The schedule for implementation of this conceptual design, as outlined in Section 8.0 of this report, is dependent upon a number of critical factors including the time required by the Department in approving this FFS and the proposed SCSs, issuance of a decision document by the Department, the time required for development of the final design of the RAP, approval by the Department of the RAP, securing of any necessary Department permits, and the scheduling of space at a permitted TSCA landfill to accept all soils excavated. Monsanto currently believes that with the Department's assistance, field activities could begin during 1993.

7.3 Design Criteria

The designs to be finalized during the RAP are limited to items such as the final design of the sheet-piling depth to assure safety during field operations, an erosion and sediment control plan, the design of pumping systems to be used during dewatering operations, and the design of a water treatment system capable of meeting the discharge requirements of any permits that may be applied for or are currently held by potential disposal facilities to be utilized. Specific criteria which can affect the implementation of the conceptual design include expected quality of water which will be generated during dewatering operations, any potential leakage which may cause infiltration of ground water during dewatering activities, expected volumes of soil and water for holding tank sizing, loading estimates for transportation and disposal of the PCB-impacted soils, and an assessment of storm-water runoff from the capped area.

7.4 Site Layout

A conceptual removal operation has been depicted as Figure 32. A site plan showing a conceptual layout of proposed on-site equipment including temporary storage tanks, loading areas, decontamination areas, exclusion zones, and dewatering equipment is attached as Figure 35. The layout shown in this figure may be modified following final design changes to be included in the RAP.

7.5 Operation and Maintenance Description

Operation and maintenance of the asphalt cap is the primary long-term concern at this site. It is anticipated that this can be included as a condition in the deed restriction.

7.6 Health and Safety Plan

A complete Health and Safety Plan (HASP) will be formulated for all intrusive activities planned for the site in accordance with OSHA's Guidance Manual for Hazardous Waste Site Activities. The site-specific HASP will address all health and safety concerns required on-site including, but not limited to, air monitoring, worker levels of protection, exclusion areas, defined contamination reduction zones for each AOC, emergency information related to site contaminants and equipment safety protocol to be followed during site activities. A copy of the complete HASP will be included with the RAP to be submitted following approval of this FFS.

8.0 SCHEDULE OF ACTIVITIES

A conceptual implementation schedule for this project has been provided on Table 5. A number of assumptions have been used to develop this outline, and the Department's assistance will be needed to meet these time frames. A preliminary breakdown of the field activities scheduled is shown on Figure 36 and briefly described below.

Field activities will be broken down into seven basic tasks. The first task will include the installation of sheet-piling; the second task will include the installation of the dewatering equipment in each AOC; the third task, which will be going on concurrently with tasks 1 and 2, includes the mobilization of all necessary excavation equipment, holding tanks, and treatment equipment; the fourth task includes the excavation and backfilling activities; the fifth task includes the post treatment and disposal of soils and water (i.e. loading and transportation of soils or treatment of water); the sixth task includes the decontamination and demobilization of removal operation equipment; and the last task involves site restoration and encapsulation. It is anticipated that all field work can be completed within a 14 week period, however, further definition of the schedule will be provided in the RAP.

9.0 REMEDIAL ACTION PLAN SCOPE OF WORK

Upon Department review, comment and approval of the ACS petition, a detailed Remedial Action Plan (RAP) will be prepared for implementation of the selected remedy. The general components of the RAP, as defined in the ACO, are as follow:

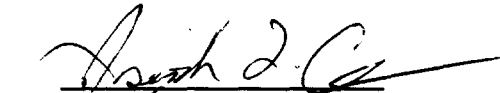

- Detailed engineering design;
- Schedule of construction, operation and maintenance;
- Operation, maintenance, monitoring and reporting requirements;
- Performance evaluation; and
- Complete and detailed cost estimate.

A preliminary RAP will be submitted to the Department for review and comment. The final RAP will incorporate the Department's comments and serve as the guidance document for implementation of the selected remedy.

Respectfully Submitted,
ROUX ASSOCIATES, INC.



Peter J. Palko
Project Engineer


Joseph Clifford, P.E.
Senior Engineer
Gregory D. Martin, P.G.
Senior Hydrogeologist/Project Manager

REFERENCES

- 1 NJDEPE and Monsanto Chemical Company, June 24, 1989. Administrative Consent Order.
- 2 NJDEPE Correspondence dated May 7, 1992. (RI Conditional Approval).
- 3 NJDEPE Correspondence dated September 16, 1992. (Focused Feasibility Study Issues).
- 4 Roux Associates, Inc., August 30, 1992. Preliminary Remedial Investigation Report, Volumes I, II, III, Monsanto Kearny Plant, Kearny, New Jersey. Roux Associates, Inc.; West Deptford, New Jersey.
- 5 Roux Associates, Inc., December 18, 1989. Remedial Investigation Workplan, Monsanto Kearny Plant, Kearny, New Jersey. Roux Associates, Inc.; West Deptford, New Jersey.
- 6 Roux Associates, Inc., May 18, 1990. Remedial Investigation Workplan, Addendum I, Monsanto Kearny Plant, Kearny, New Jersey. Roux Associates, Inc.; West Deptford, New Jersey.
- 7 Roux Associates, Inc., May 5, 1991. Revised Remedial Investigation Workplan, Addendum II, Monsanto Kearny Plant, Kearny, New Jersey. Roux Associates, Inc.; West Deptford, New Jersey.
- 8 USEPA Region II, May 4, 1987. 40 CFR 761.125, TSCA, Subpart G, PCB Spill Cleanup Policy.

Table 1. Summary of Site Process Operations. Monsanto Kearny Plant, Kearny, New Jersey.

| Year | Activity |
|-------------|---------------------------------------------------------------------------------------------------|
| 1955 | Production of phosphoric acid and sodium tripolyphosphate (STP) begins. |
| 1956 | Production of Steroxes begins. |
| 1960 | Production of Alkylphenols begins. |
| 1966 | Second units of phosphoric acid and STP begin production. |
| 1983 | Older STP unit terminates production. |
| 1985 | All phosphates manufacturing terminates (i.e. phosphoric acid and STP), and units are dismantled. |
| 1990 | Sterox production terminates. |
| 1991 | Alkylphenol production terminates. |

Table 2. ARARs and SCSs for Site Soils. Monsanto; Kearny, New Jersey.

| | Residential Surface
Soils (mg/kg) | Non-Residential (or
Restricted) Surface
Soils (mg/kg) | Subsurface Soils Above
and Below Confining
Unit (mg/kg) |
|-------------------------------|----------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------|
| NJDEPE Soil Cleanup Criteria | 0.49 | 2 | 100 |
| USEPA CFR 761.125 | 10 | 25 | 25 |
| Site Specific Risk Assessment | NA | 26.5 | NA |
| <hr/> | | | |
| Proposed SCSs | NA | 25 | 100 |

Table 3. Summary of TCLP Analytical Results vs. Regulatory Level; Monsanto Company, Kearny, New Jersey.

| | Regulatory
Level | SSP-0406 | APSS-0406 | PDA-SS | PDA-0406 | PDA-1012 |
|-------------------------------------------------------|---------------------|----------|-----------|-------------|----------|-----------|
| Sample Depth Interval
(depth below ground surface) | | 4' - 6' | 4' - 6' | 0.5' - 2.5' | 4' - 6' | 10' - 12' |
| <i>TCLP Organics⁽¹⁾</i> | | | | | | |
| Benzene | .5 | ND | ND | ND | ND | ND |
| Carbon Tetrachloride | .5 | ND | ND | ND | ND | ND |
| Chlordane | .03 | ND | ND | ND | ND | ND |
| Chlorobenzene | 100 | ND | ND | ND | ND | ND |
| Chloroform | 6 | ND | ND | ND | ND | ND |
| Cresol (O,M,P) | 200 | ND | .03 | ND | ND | ND |
| 2,4-D | 10 | ND | ND | ND | ND | ND |
| 1,4-Dichlorobenzene | 7.5 | ND | ND | ND | ND | ND |
| 1,2-Dichloroethane | .5 | ND | ND | ND | ND | ND |
| 1,1-Dichloroethylene | .7 | ND | ND | ND | ND | ND |
| 2,4-Dinitrotoluene | .13 | ND | ND | ND | ND | ND |
| Endrin | .02 | ND | ND | ND | ND | ND |
| Heptachlor | .008 | ND | ND | ND | ND | ND |
| Hexachlorobenzene | .13 | ND | ND | ND | ND | ND |
| Hexachlorobutadiene | .5 | ND | ND | ND | ND | ND |
| Hexachloroethane | 3 | ND | ND | ND | ND | ND |
| Lindane | .4 | ND | ND | ND | ND | ND |
| Methoxyclor | 10 | ND | ND | ND | ND | ND |
| Methyl Ethyl Ketone | 200 | ND | ND | ND | ND | ND |
| Nitrobenzene | 2 | ND | ND | ND | ND | ND |
| Pentachlorophenol | 100 | ND | ND | ND | ND | ND |
| Pyridine | 5 | ND | ND | ND | ND | ND |
| Tetrachloroethylene | .7 | ND | ND | ND | ND | ND |
| Toxaphene | .5 | ND | ND | ND | ND | ND |
| Trichloroethylene | .5 | ND | ND | ND | ND | ND |
| 2,4,5-Trichlorophenol | 400 | ND | ND | ND | ND | ND |
| 2,4,6-Trichlorophenol | 2 | ND | ND | ND | ND | ND |
| 2,4,5-TP (Silvex) | 1 | ND | ND | ND | ND | ND |
| Vinyl Chloride | .2 | ND | ND | ND | ND | ND |
| <i>TCLP Metals⁽¹⁾</i> | | | | | | |
| Arsenic | 5 | ND | ND | ND | 0.02 | 0.04 |
| Barium | 100 | 0.05 | ND | ND | 0.04 | ND |
| Cadmium | 1 | ND | ND | 0.11 | ND | ND |
| Chromium | 5 | ND | ND | ND | ND | ND |
| Lead | 5 | 0.53 | ND | ND | ND | ND |
| Mercury | .2 | ND | ND | ND | ND | ND |
| Selenium | 1 | ND | ND | ND | ND | ND |
| Silver | 5 | ND | ND | ND | ND | ND |
| <i>TCLP Extraction</i> | | | | | | |
| Initial pH | NA | 8.5 | 9.5 | 8.2 | 8.4 | 8.9 |
| Final pH | NA | 5.4 | 5.3 | 4.9 | 4.8 | 4.9 |

⁽¹⁾Results expressed in milligrams per liter (mg/l).

ND = Not detected.

NA = Not applicable.

Table 4. Remedial Alternatives Retained for Screening and Estimated Costs. Monsanto Kearny Plant, Kearny, New Jersey.

| Alternative Description | Estimated Cost |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 1. Excavation, Off-Site Landfilling of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions | \$4.3MM |
| 2. Excavation, Off-Site Incineration of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions | \$12MM |
| 3. Excavation, On-Site Thermal Desorption of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions | \$4.8MM |
| 4. In-Situ Solidification of PCB-Impacted Soils, Asphalt Cap, and Deed Restrictions | \$1.5MM |

MM = 1 million.

Table 5. Conceptual Implementation Schedule.^(1,2) Monsanto Kearny Plant, Kearny, New Jersey.

| Description | Duration (weeks) |
|---------------------------------------------------------------|-------------------------|
| Submission of Final FFS to the Department | 0 |
| Approval of Final FFS by Department (includes comment period) | 2 |
| Department Completion of Decision Document | 4-8 ⁽³⁾ |
| Submission of Remedial Action Work Plan | 4-8 ⁽³⁾ |
| Approval of Remedial Action Work Plan | 4 |
| Completion of Contractor Selections | 4 |
| Completion of Field Activities ⁽⁴⁾ | 14 |
| Submission of Field Activities Summary Report | 10 |

⁽¹⁾ The schedule described above is considered approximate and is dependent upon a number of factors outside the immediate control of Monsanto Company or its subcontractors.

⁽²⁾ A more detailed schedule of construction, operation and maintenance activities will be presented in the Remedial Action Plan.

⁽³⁾ Decision Document and Remedial Action Work Plan to be completed concurrently.

⁽⁴⁾ A more detailed breakdown of the field activities schedule is presented in Figure 36.

Table 4. Remedial Alternatives Retained for Screening and Estimated Costs. Monsanto Kearny Plant, Kearny, New Jersey.

| Alternative Description | Estimated Cost |
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| 2. Excavation, Off-Site Incineration of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions | \$12MM |
| 3. Excavation, On-Site Thermal Desorption of PCB-Impacted Soils, Dewatering and Water Treatment, Asphalt Cap, and Deed Restrictions | \$4.8MM |
| 4. In-Situ Solidification of PCB-Impacted Soils, Asphalt Cap, and Deed Restrictions | \$1.5MM |

MM = 1 million.

Table 5. Conceptual Implementation Schedule.^(1,2) Monsanto Kearny Plant, Kearny, New Jersey.

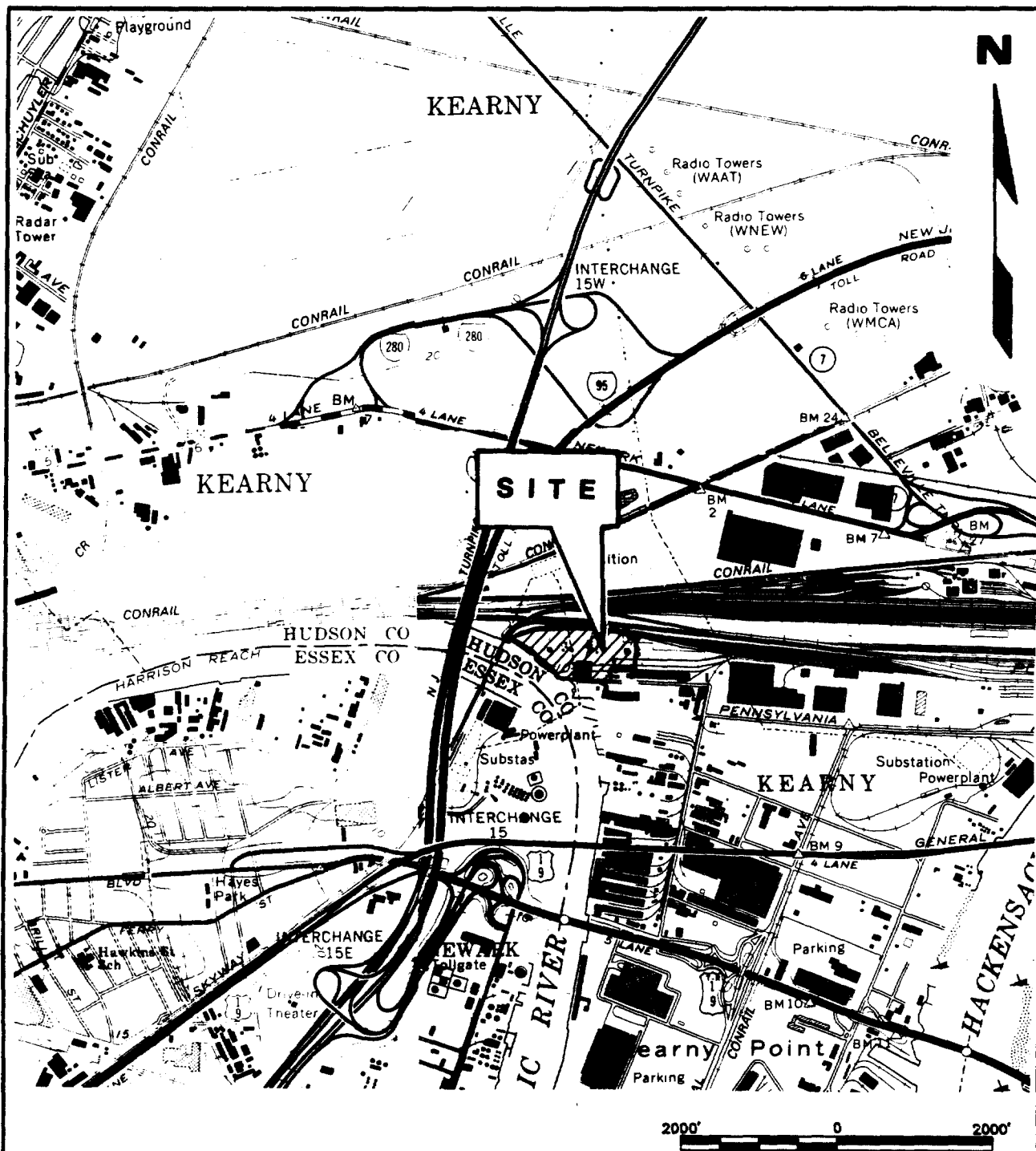
| Description | Duration (weeks) |
|---------------------------------------------------------------|-------------------------|
| Submission of Final FFS to the Department | 0 |
| Approval of Final FFS by Department (includes comment period) | 2 |
| Department Completion of Decision Document | 4-8 ⁽³⁾ |
| Submission of Remedial Action Work Plan | 4-8 ⁽³⁾ |
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| Completion of Contractor Selections | 4 |
| Completion of Field Activities ⁽⁴⁾ | 14 |
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⁽¹⁾ The schedule described above is considered approximate and is dependent upon a number of factors outside the immediate control of Monsanto Company or its subcontractors.


⁽²⁾ A more detailed schedule of construction, operation and maintenance activities will be presented in the Remedial Action Plan.

⁽³⁾ Decision Document and Remedial Action Work Plan to be completed concurrently.

⁽⁴⁾ A more detailed breakdown of the field activities schedule is presented in Figure 36.

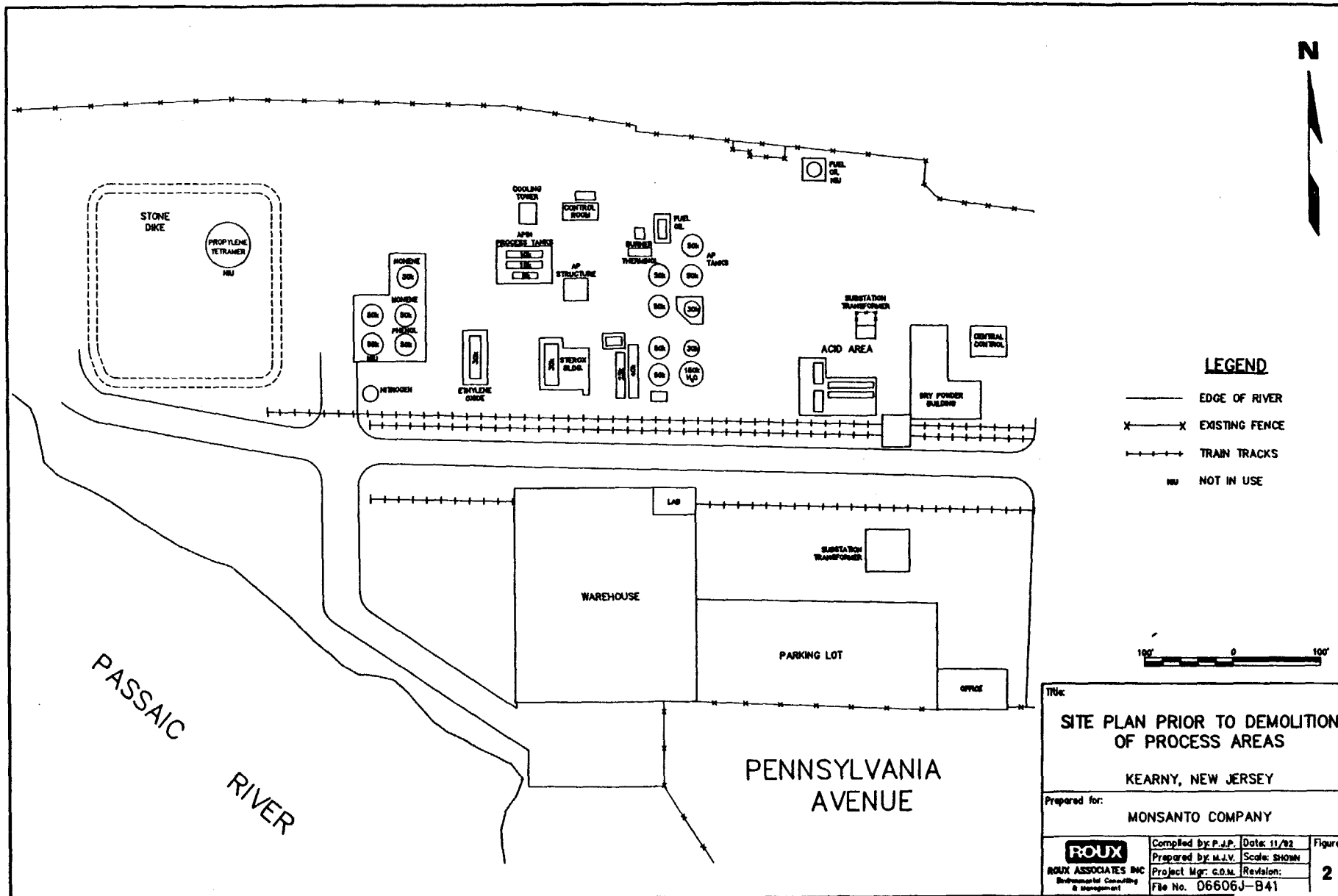


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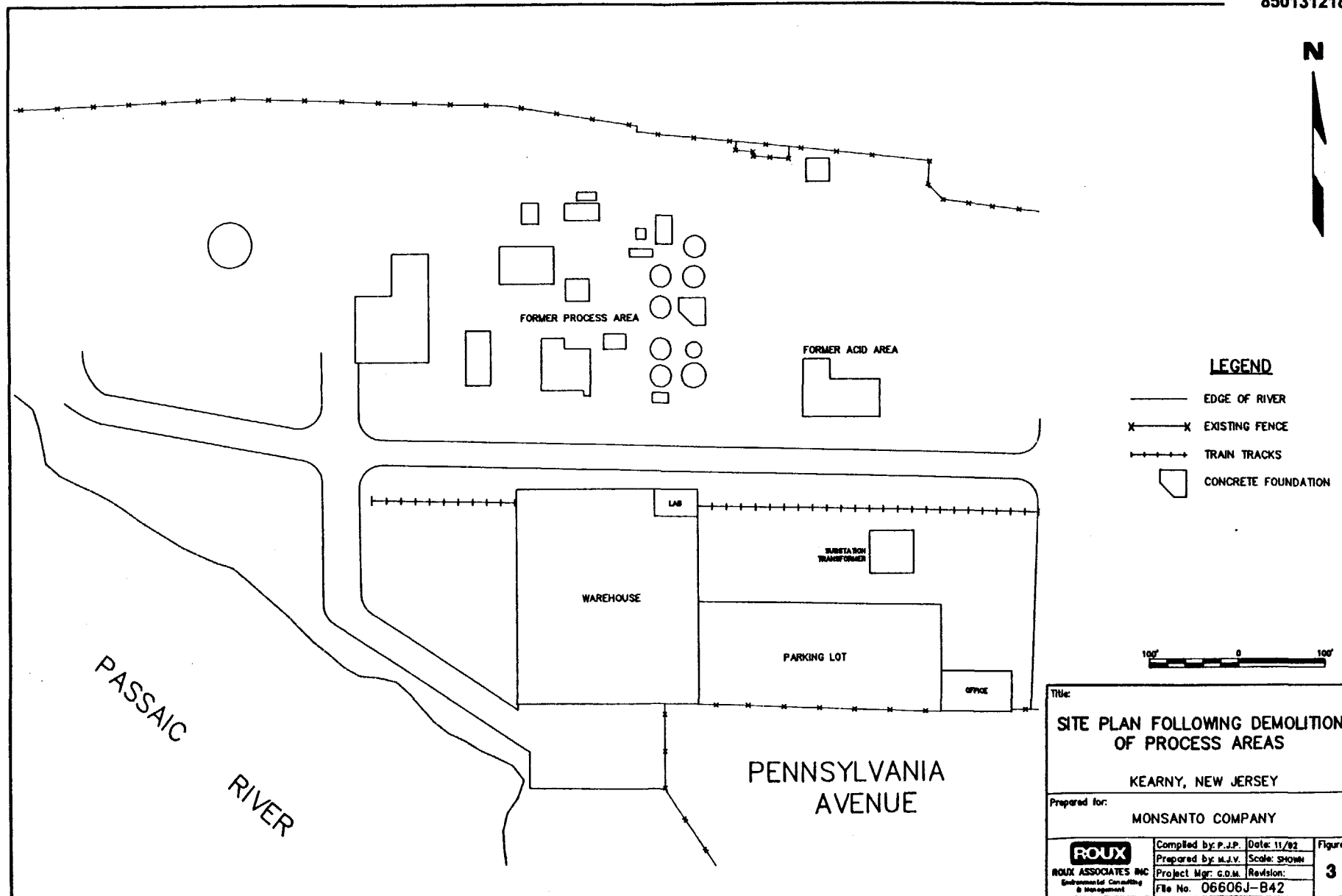
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| KEARNY PLANT
KEARNY, NEW JERSEY | | | | |
| Prepared for: | | | | |
| MONSANTO COMPANY | | | | |
| 
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure

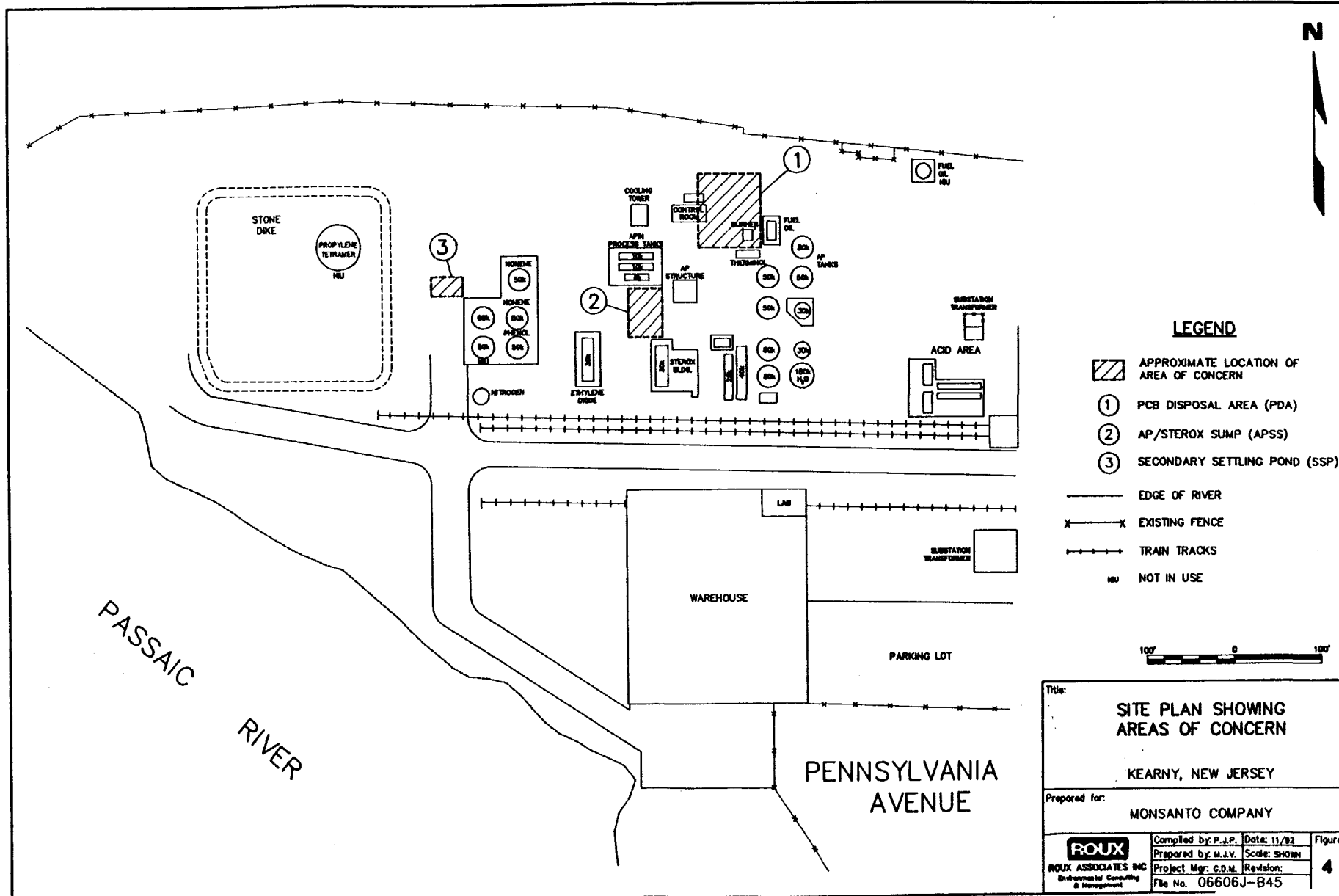
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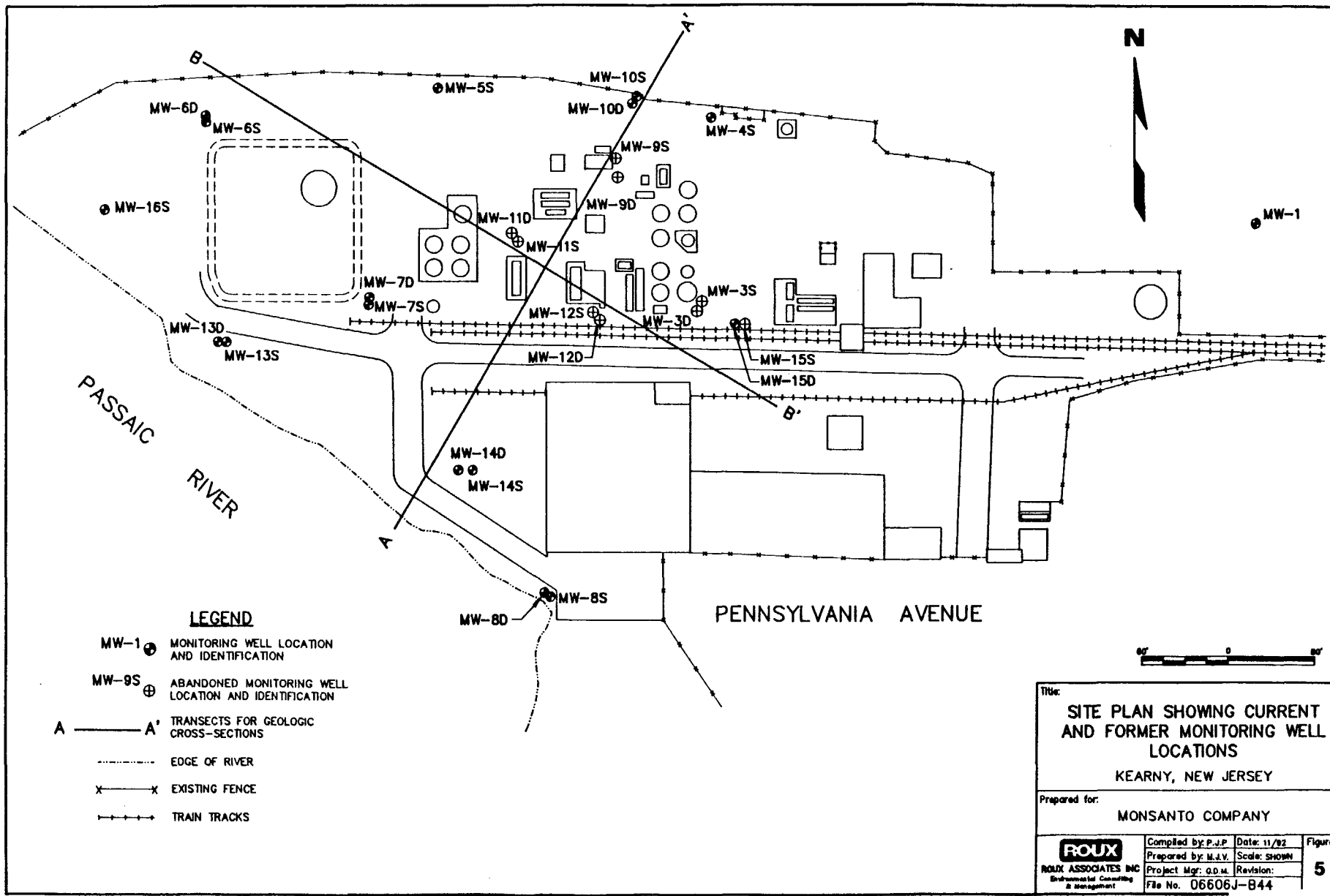


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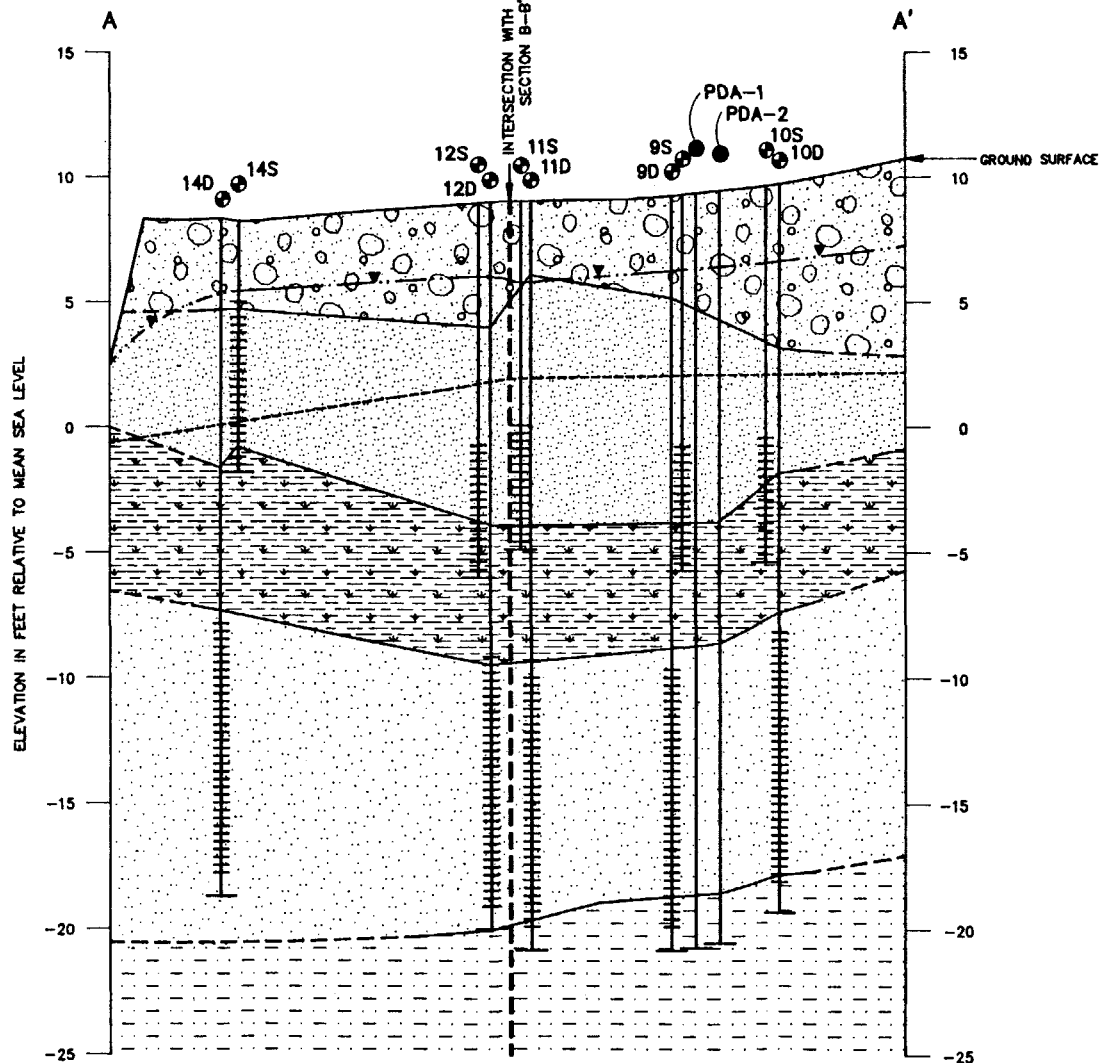
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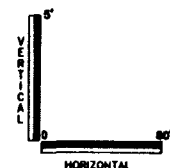
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LEGEND

- 10S ● MONITORING WELL LOCATION AND IDENTIFICATION
- PDA-1 ● SOIL BORING LOCATION AND IDENTIFICATION
- TOTAL DEPTH OF WELL OR BORING
- SCREENED INTERVAL OF MONITORING WELL
- POTENTIOMETRIC SURFACE OF CONFINED LOWER WATER-BEARING ZONE (MARCH-APRIL, 1991)
- INFERRED GEOLOGY
- WATER-TABLE (MARCH-APRIL, 1991)
- FILL
- SILTY MEDIUM TO COARSE SAND
- ▨ PEAT AND CLAY
- ▨ COARSE SAND
- ▨ SILT AND CLAY

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

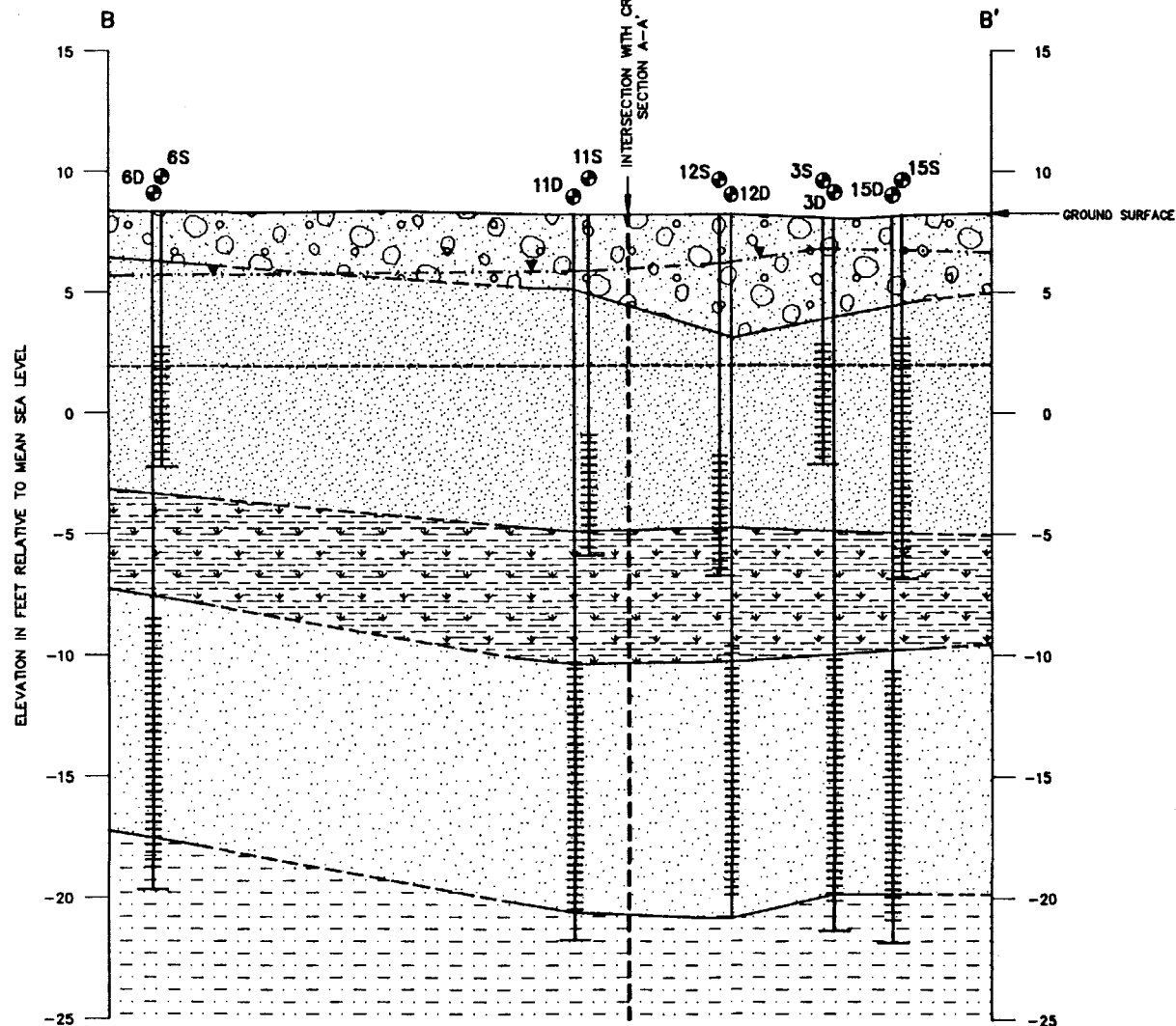


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| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
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Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
6 |
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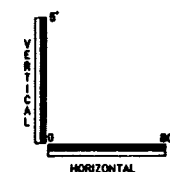
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NORTHWEST

SOUTHEAST



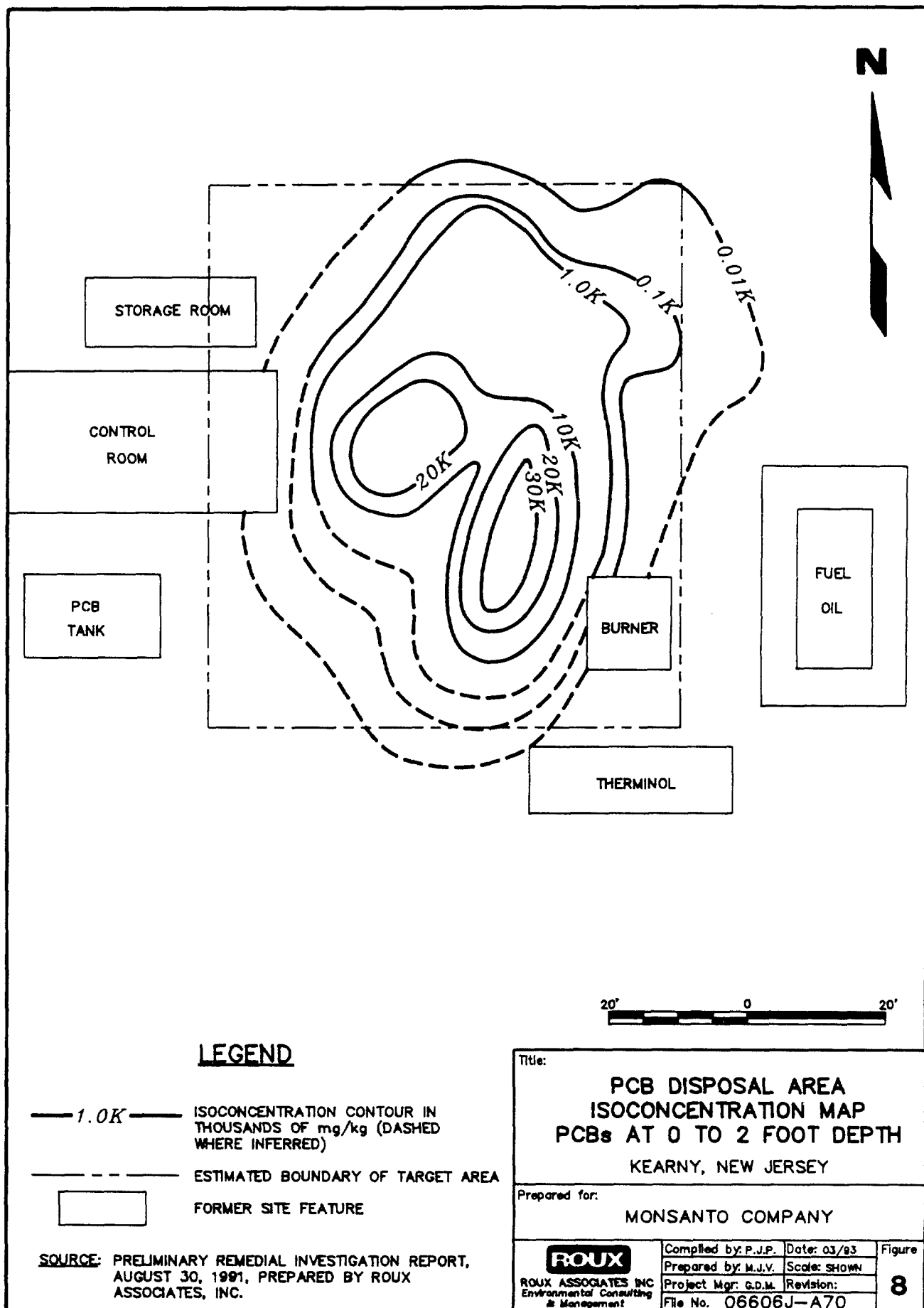
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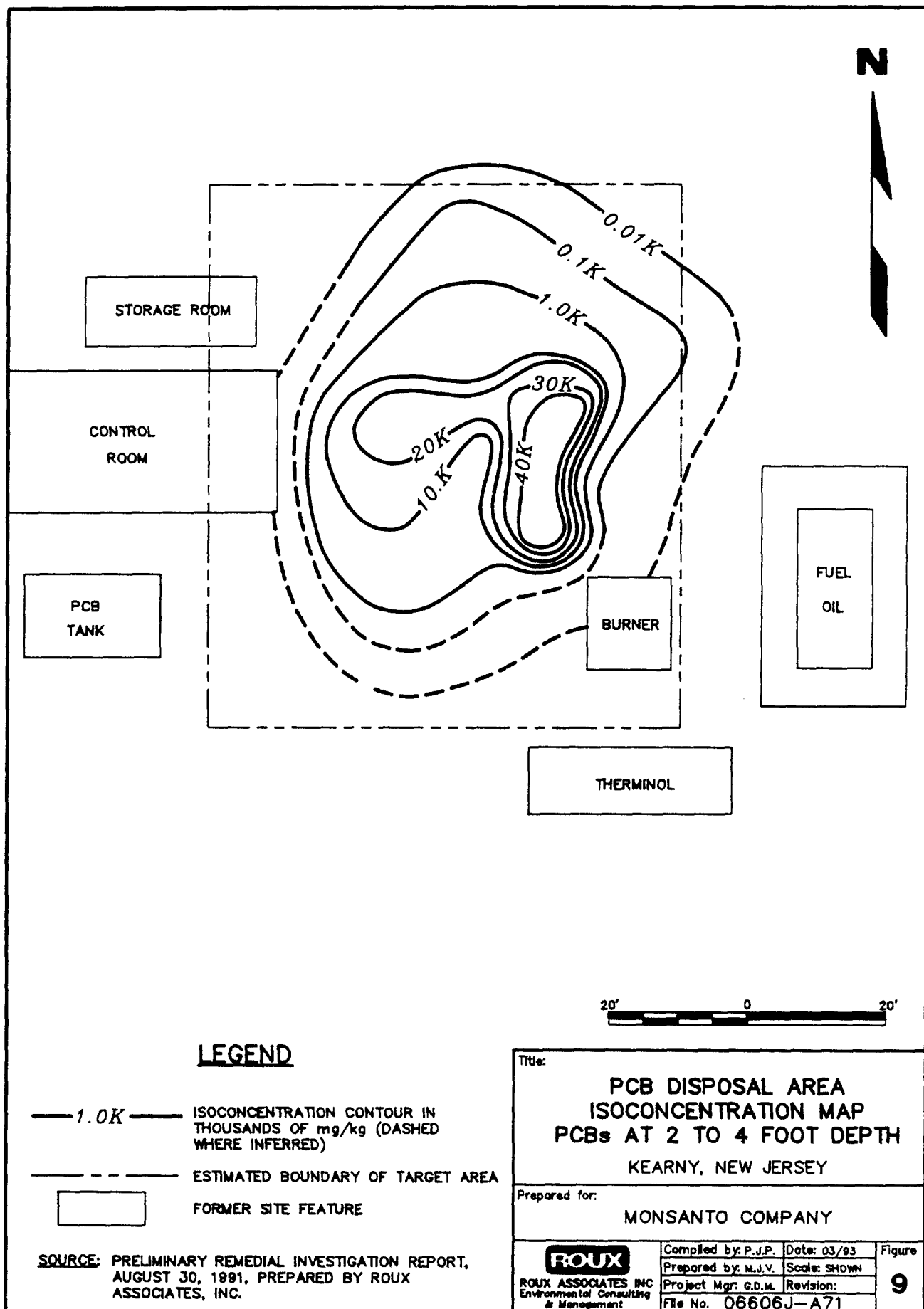
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| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
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Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure |
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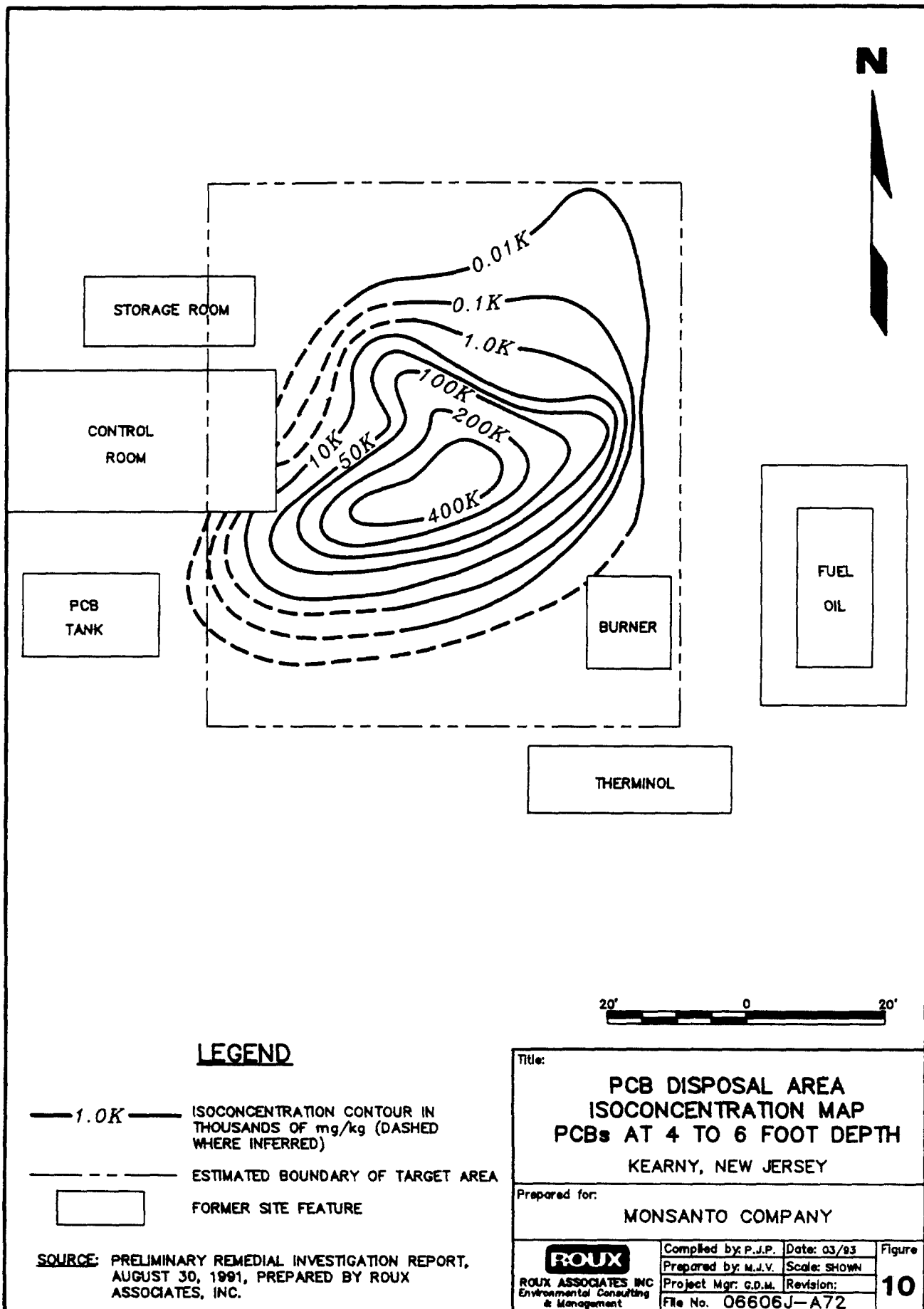
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850131223



850131224



LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 4 TO 6 FOOT DEPTH
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

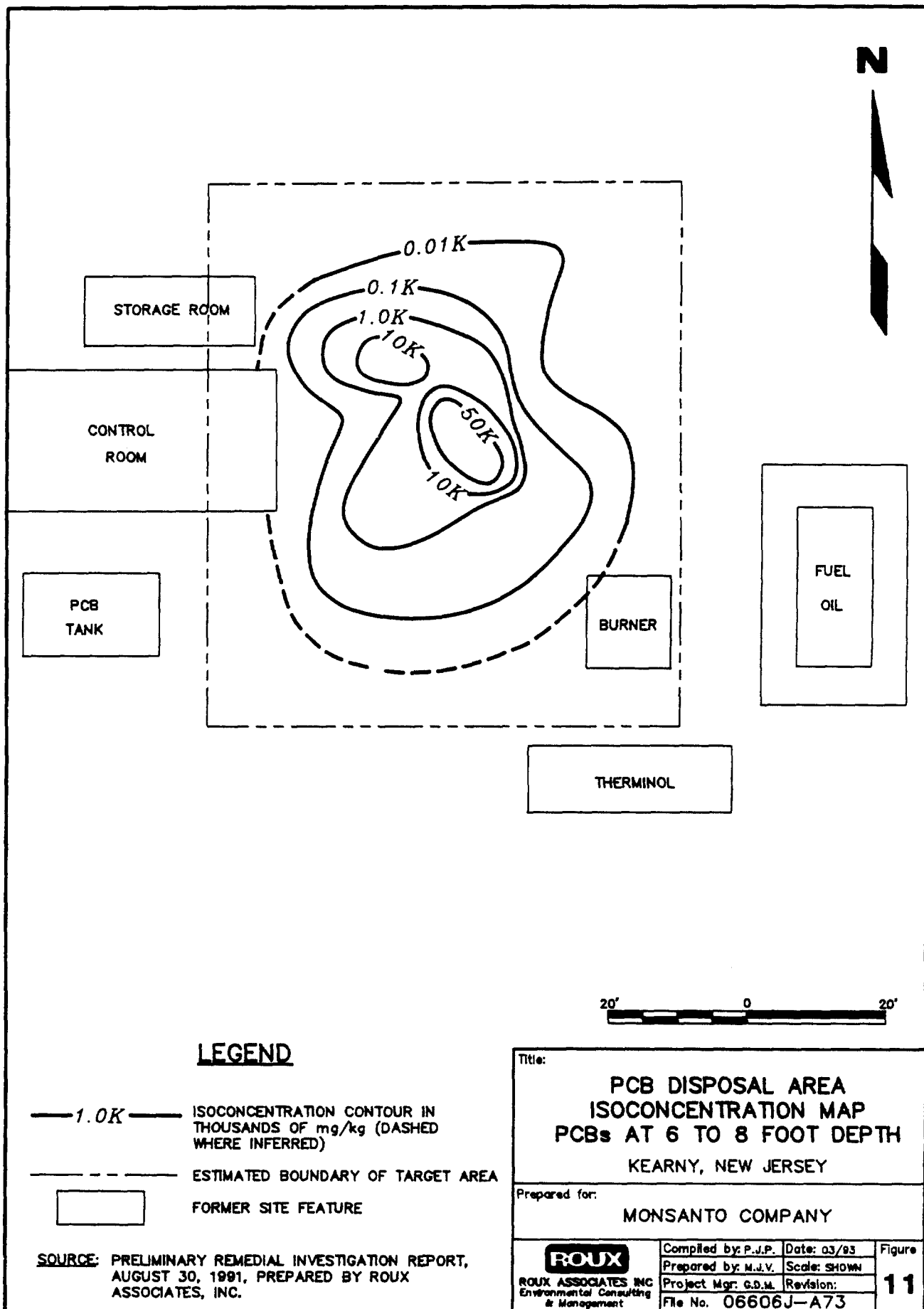
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Environmental Consulting
& Management

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| Compiled by: P.J.P. | Date: 03/93 |
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| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A72 | |

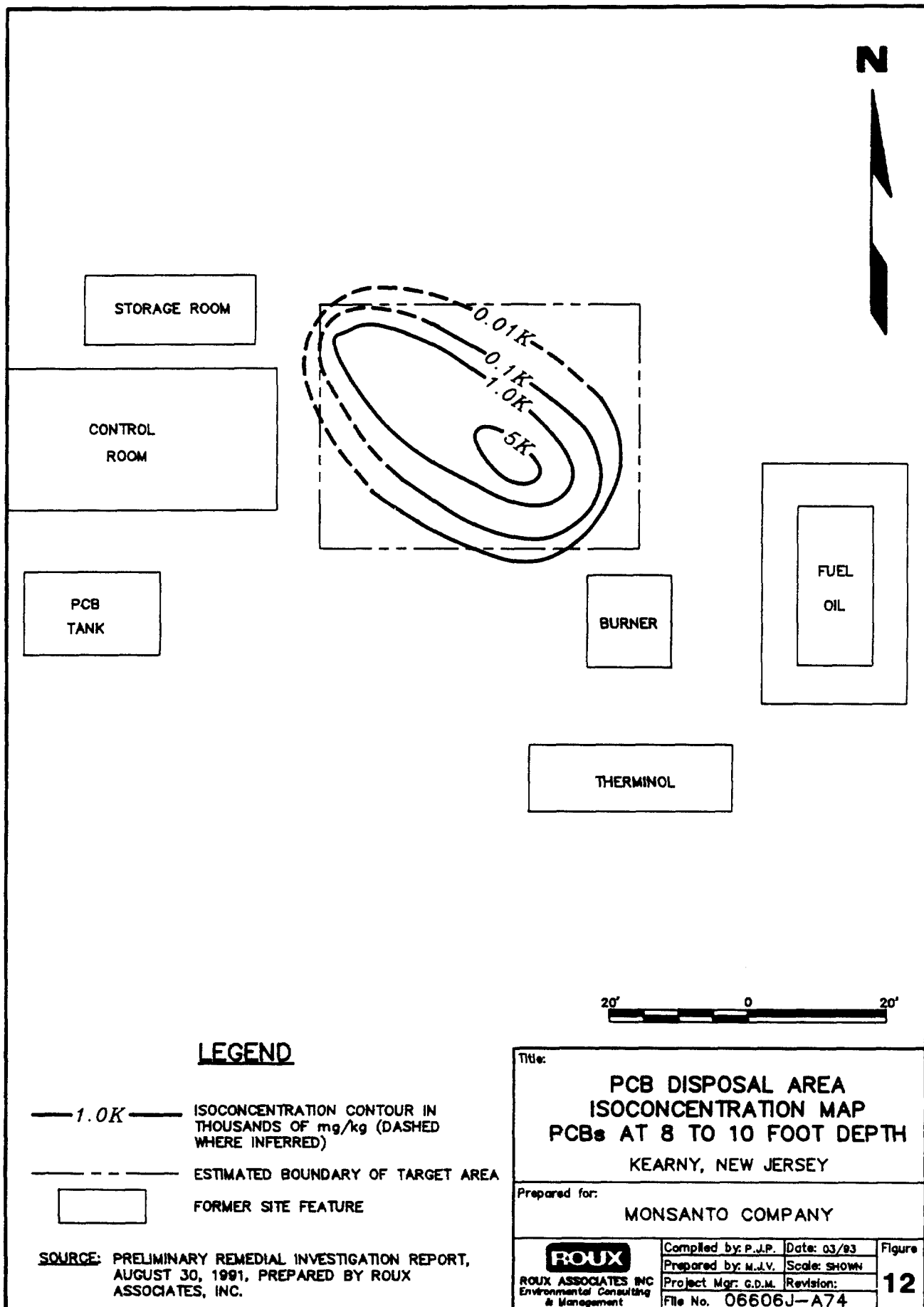
Figure

10

850131225



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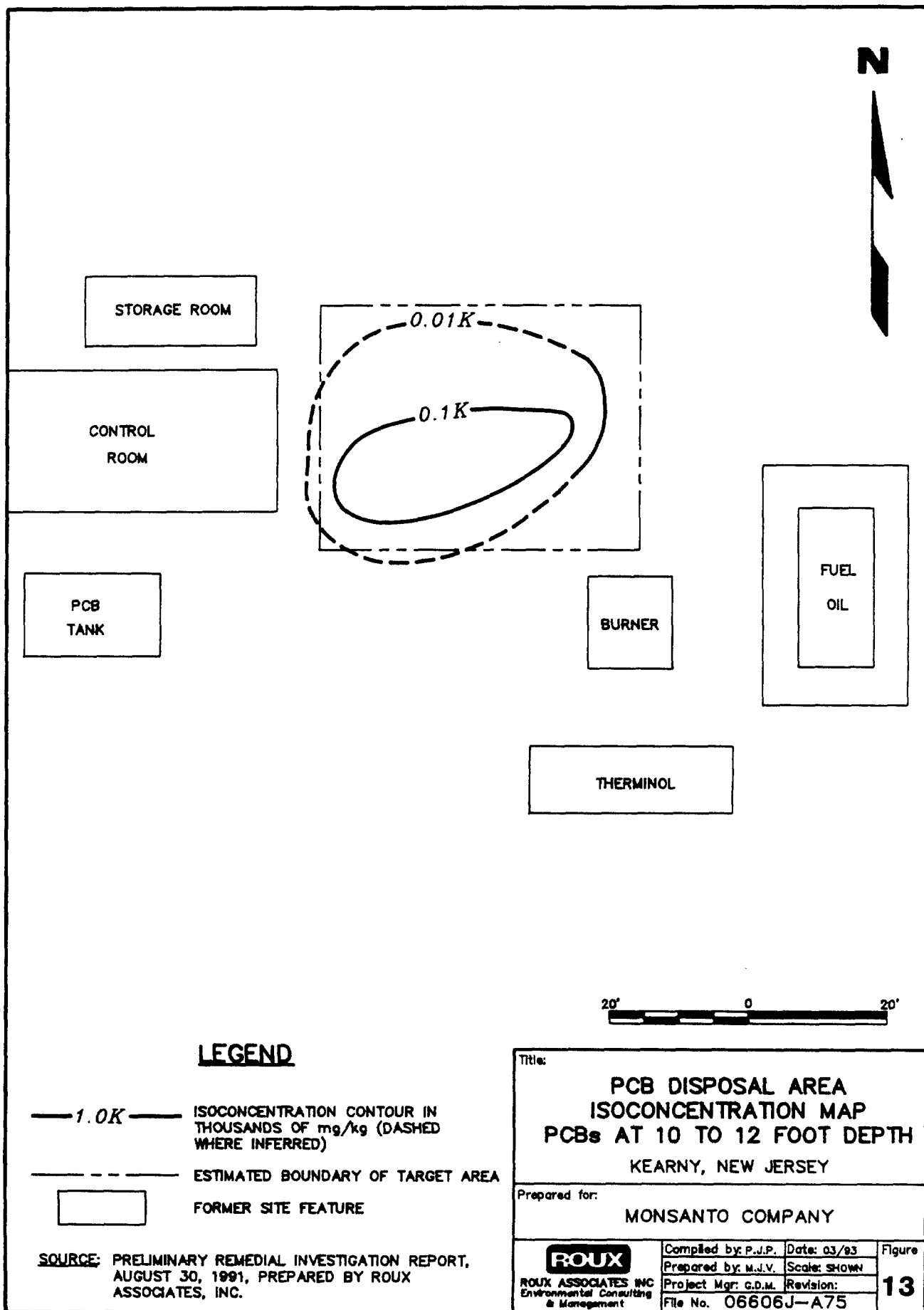


LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
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PCBs AT 8 TO 10 FOOT DEPTH
KEARNY, NEW JERSEY</p> | | | |
| <p>Prepared for:</p> <p align="center">MONSANTO COMPANY</p> | | | |
| <p align="center">ROUX</p> <p>ROUX ASSOCIATES INC
Environmental Consulting
& Management</p> | Compiled by: P.J.P. | Date: 03/93 | <p align="center">Figure</p> <p align="center">12</p> |
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| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A74 | | | |

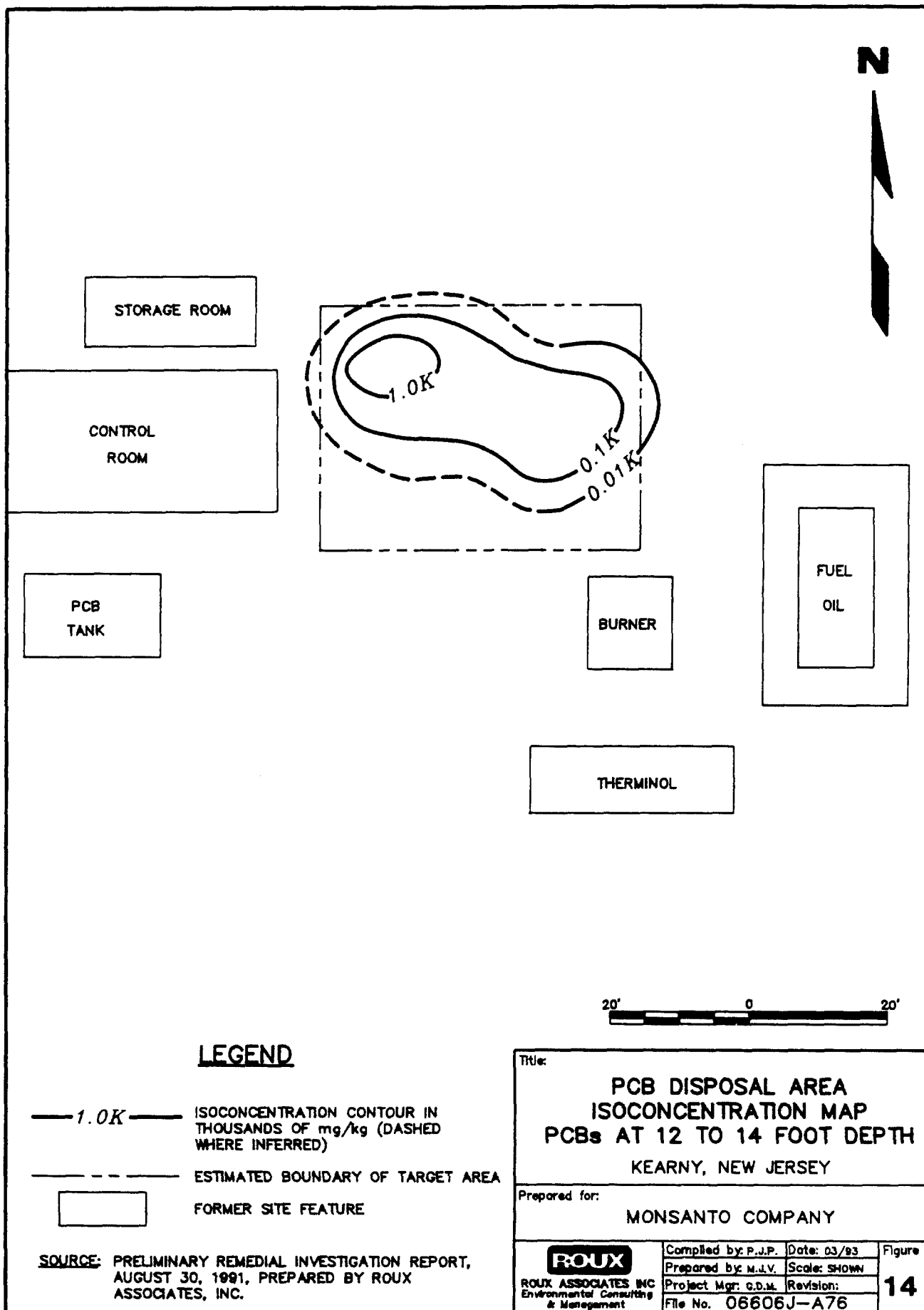


LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

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| Title: | | | |
| PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 10 TO 12 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 03/93 | Figure |
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| | File No. 06606J-A75 | | 13 |

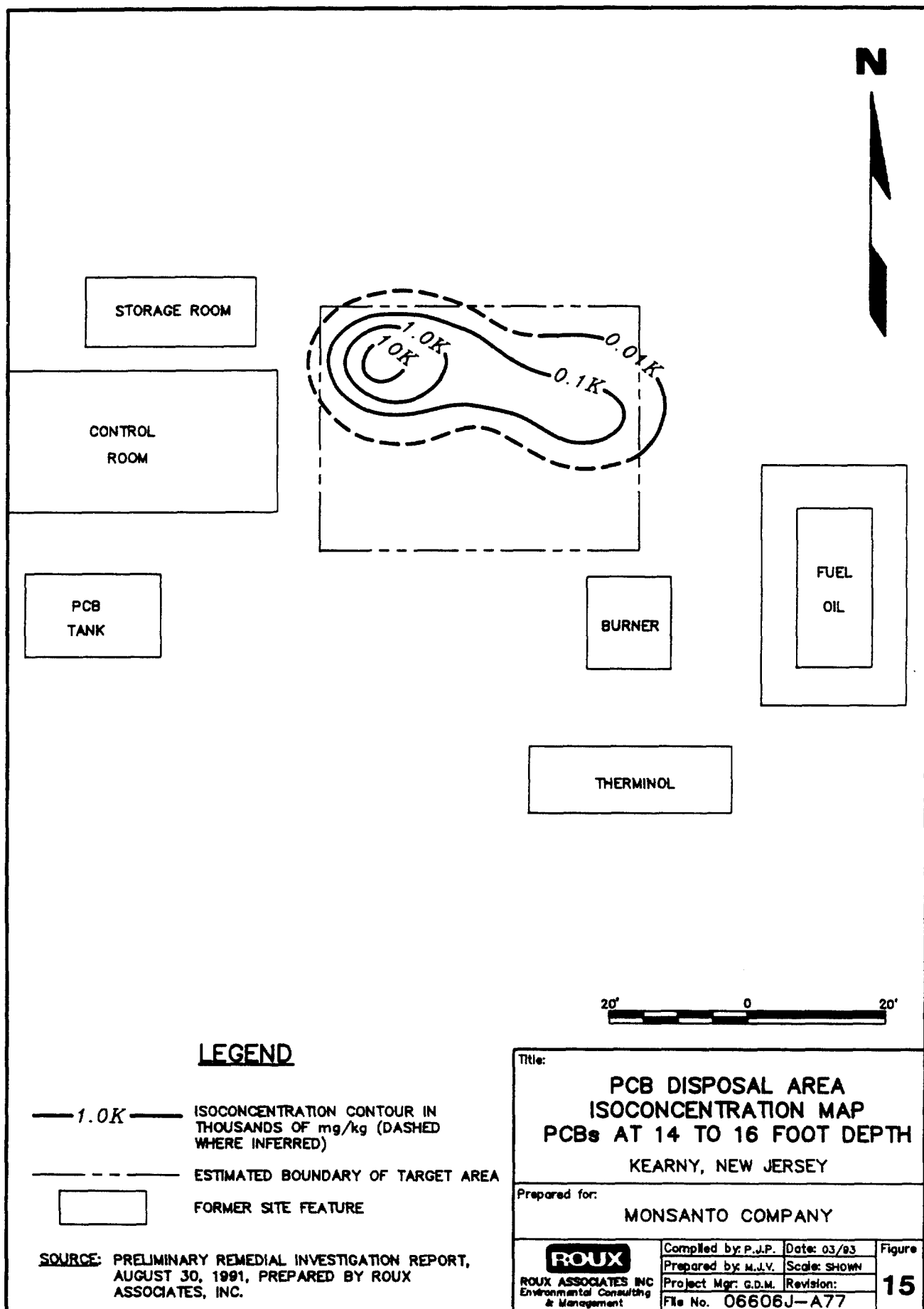


LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- [] FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|-----------------------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title:
PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 12 TO 14 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 03/93 | Figure
14 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A76 | | | |



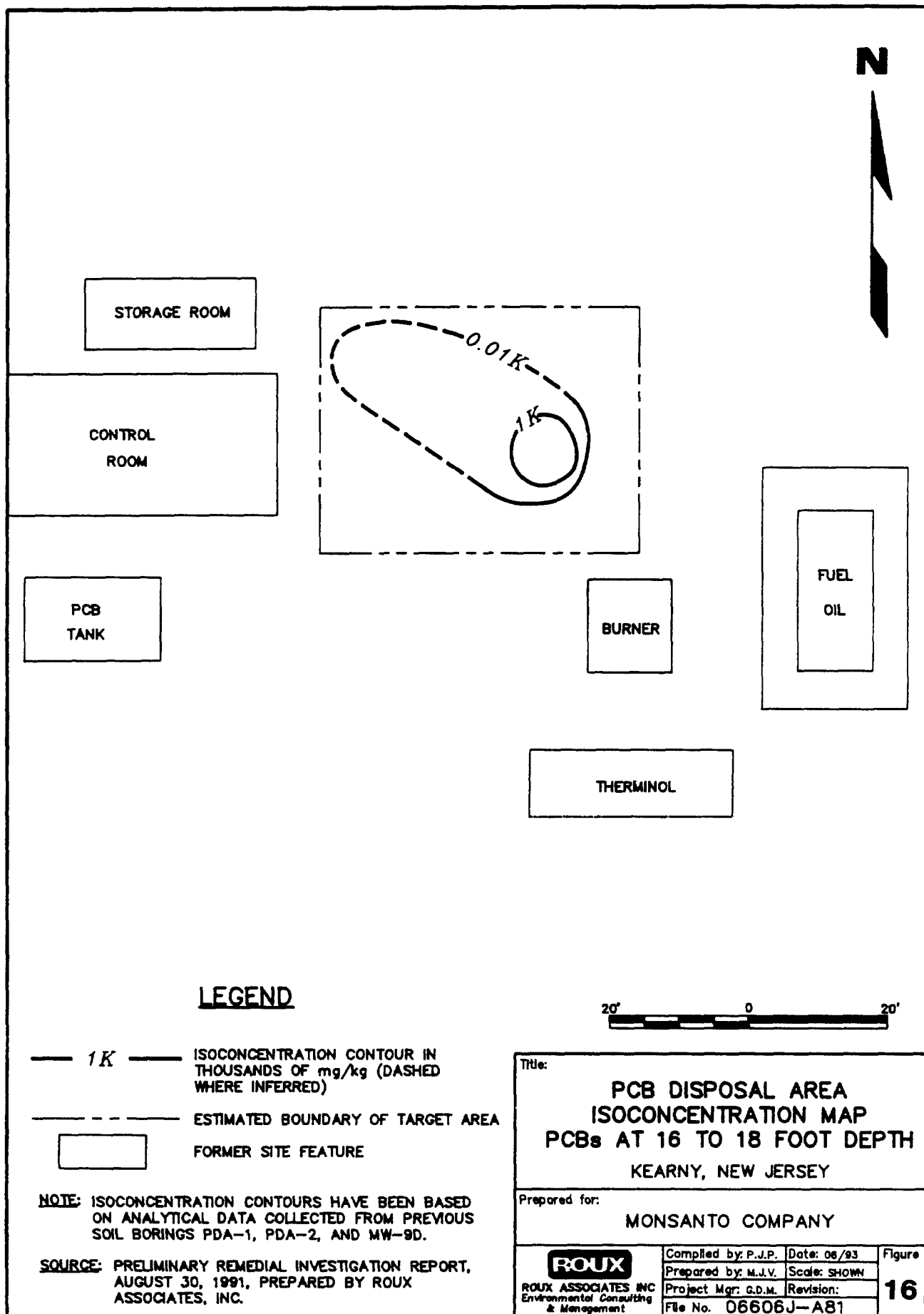
LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: | | | |
| PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 14 TO 16 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 03/93 | Figure
15 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A77 | | | |

850131230



LEGEND

- 1K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 16 TO 18 FOOT DEPTH
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

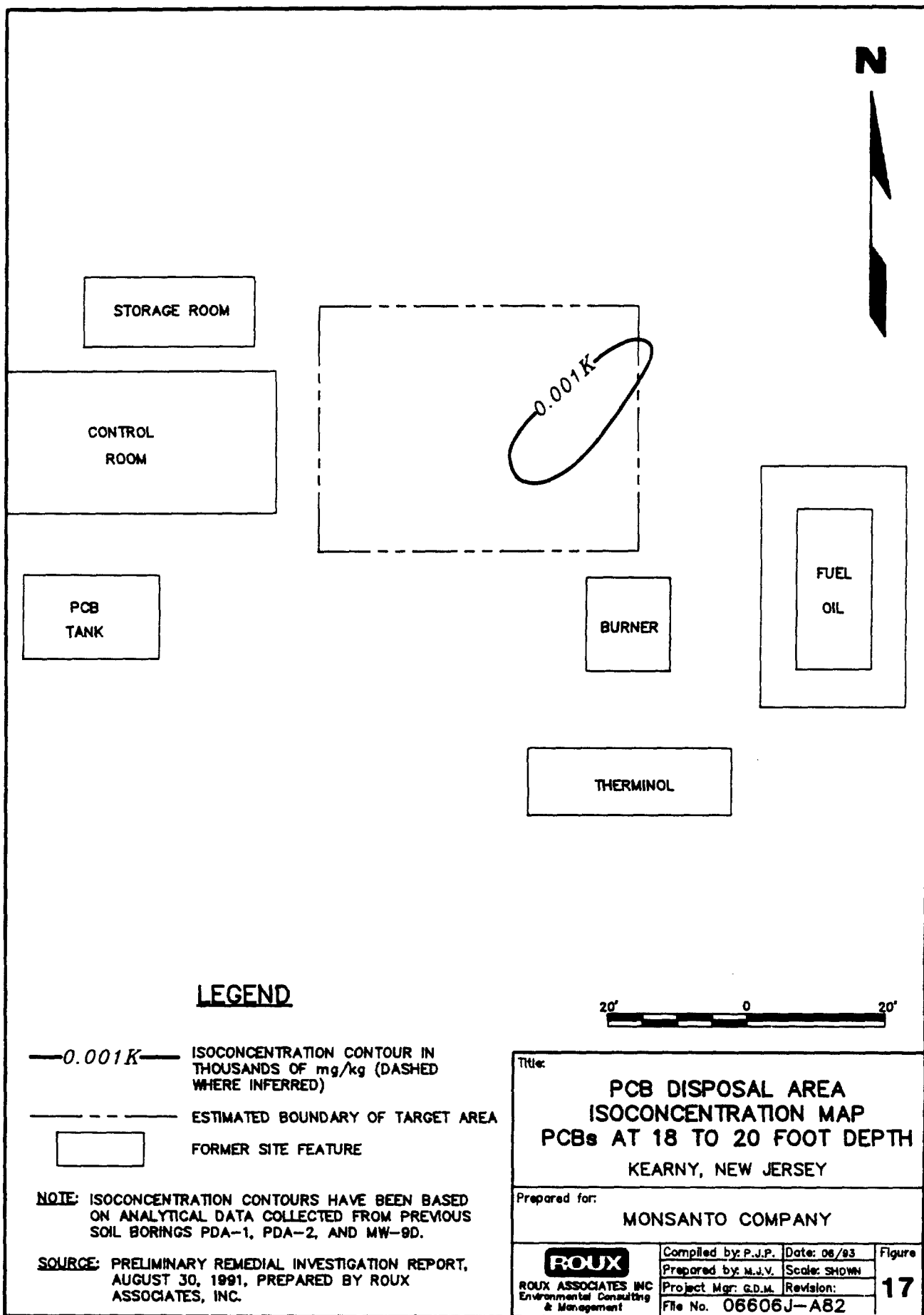
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|--------------|
| Compiled by: P.J.P. | Date: 06/93 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A81 | |

Figure

16

850131231



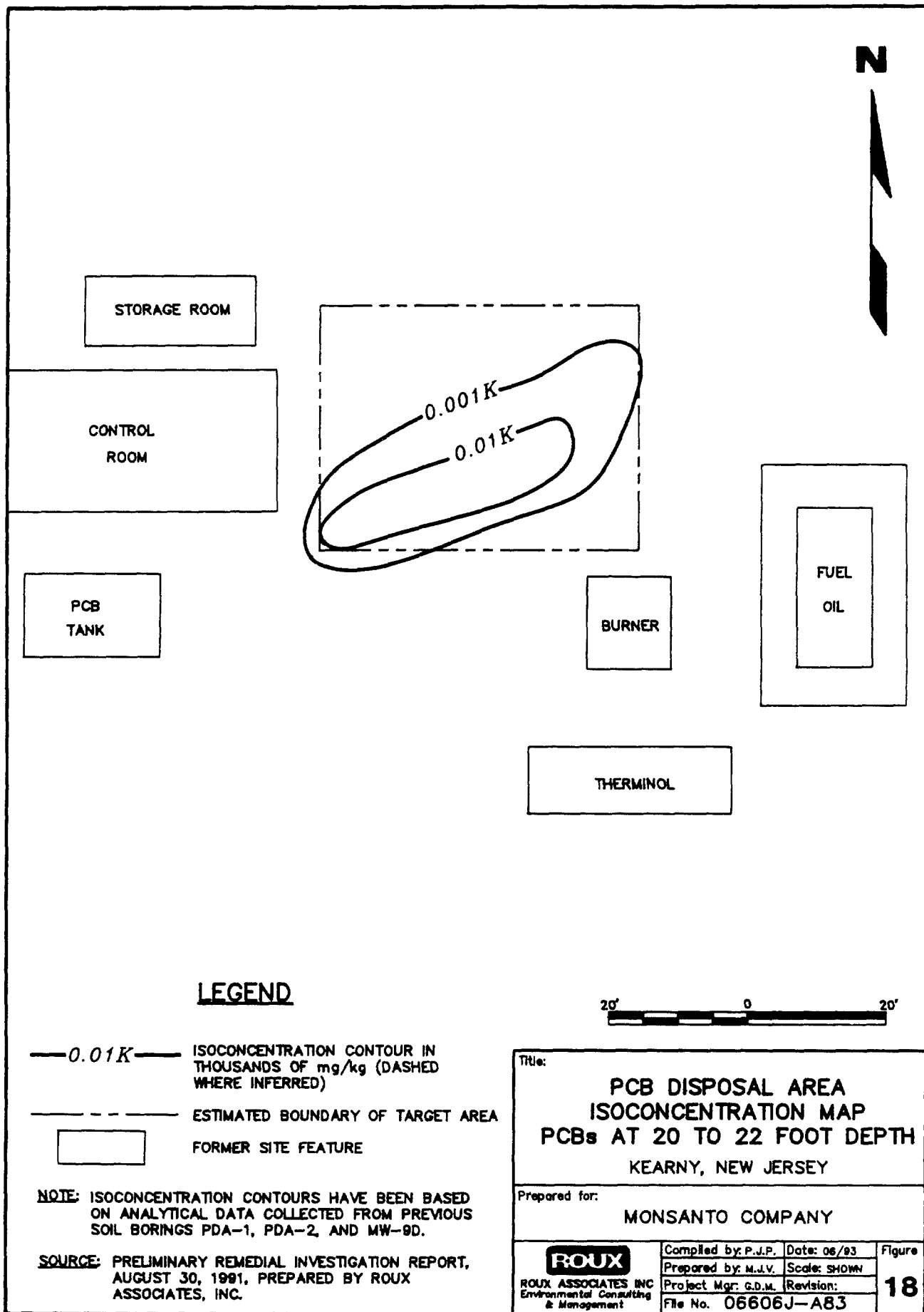
LEGEND

- 0.001K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

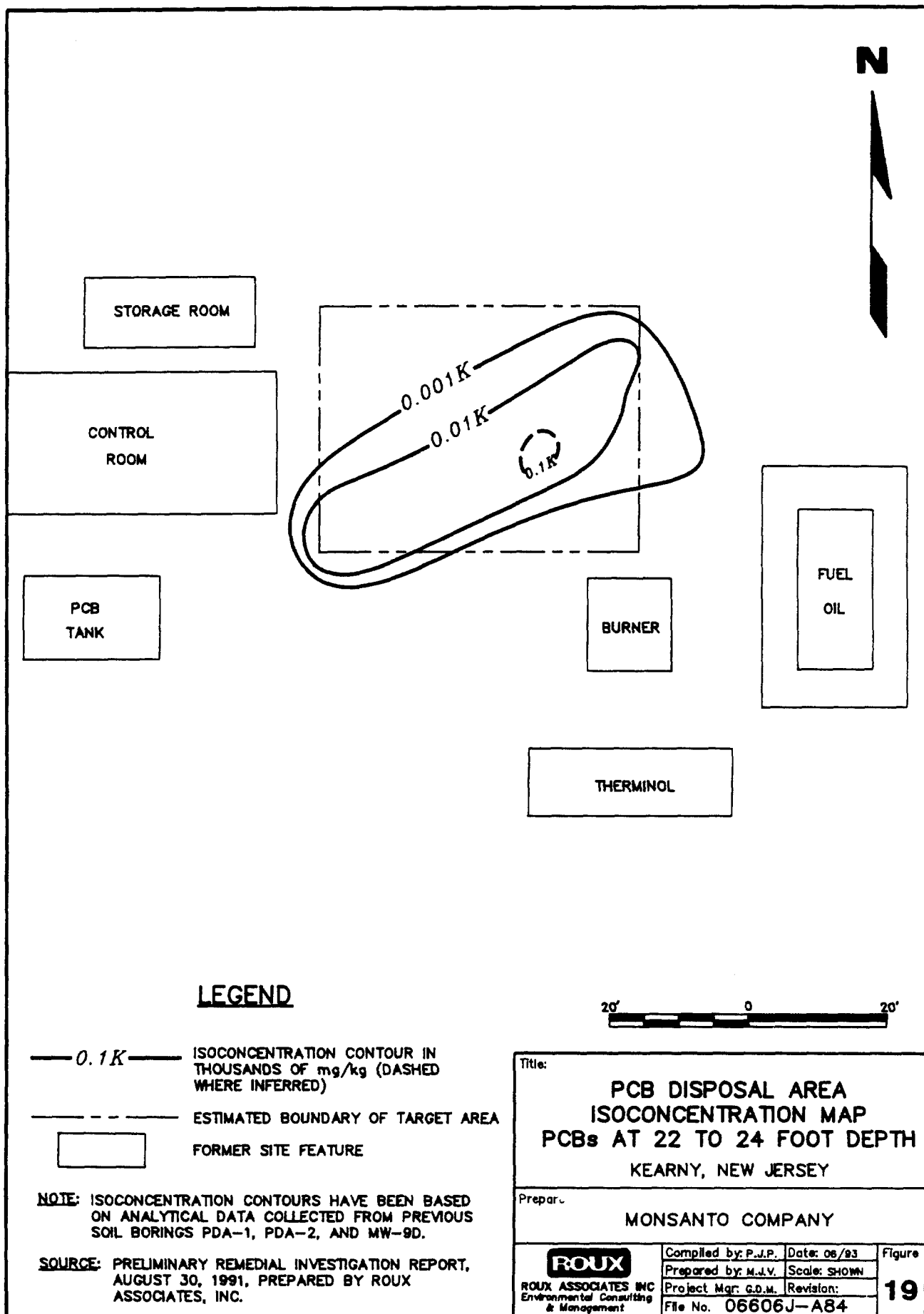
NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

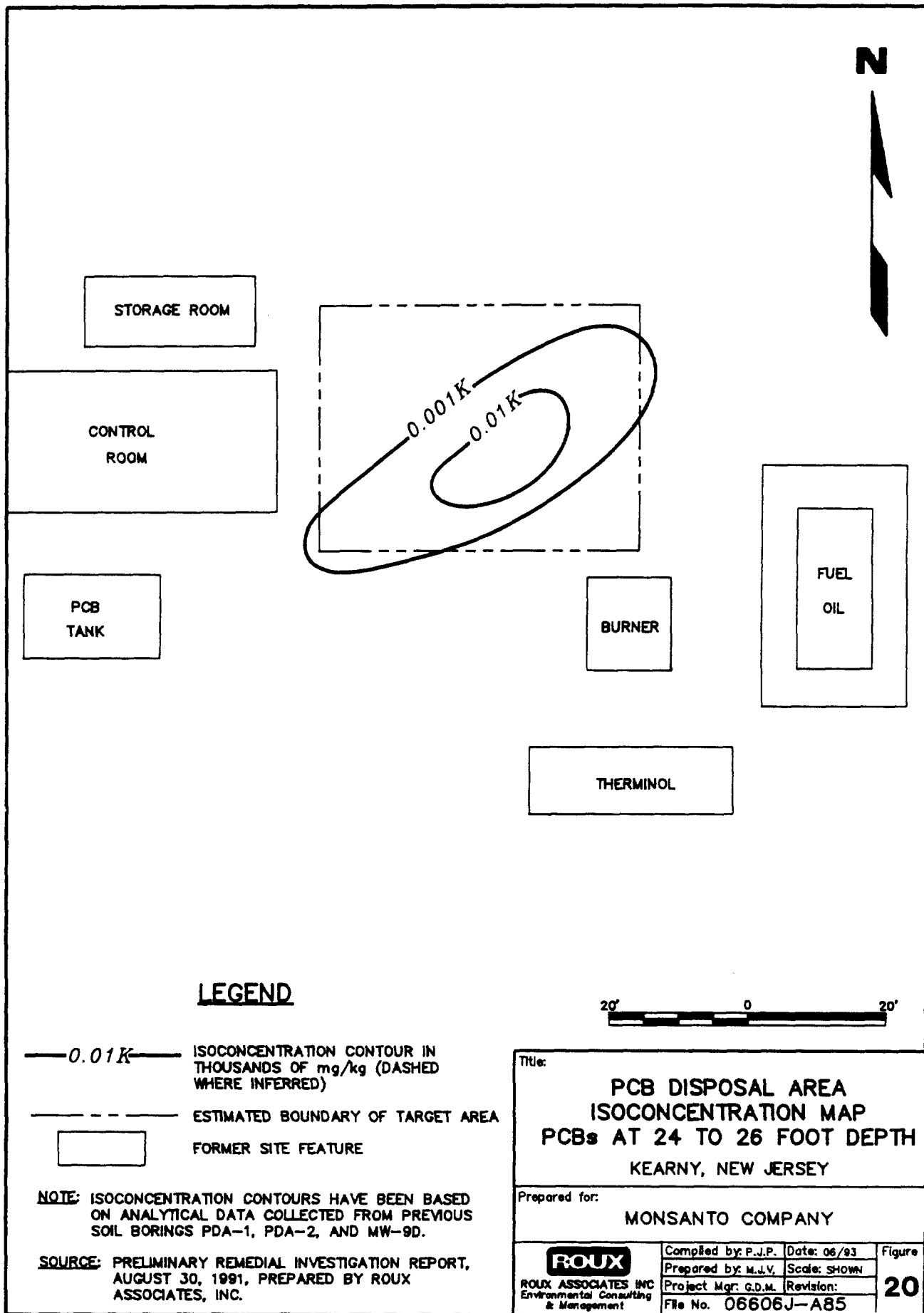
| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------|-----------------------------------------------|
| <p>Title:</p> <p align="center">PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 18 TO 20 FOOT DEPTH
KEARNY, NEW JERSEY</p> | | | |
| <p>Prepared for:</p> <p align="center">MONSANTO COMPANY</p> | | | |
| <p align="center">ROUX</p> <p>ROUX ASSOCIATES INC
Environmental Consulting
& Management</p> | <p>Compiled by: P.J.P.</p> | <p>Date: 06/93</p> | <p>Figure</p> <p align="center">17</p> |
| | <p>Prepared by: M.J.V.</p> | <p>Scale: SHOWN</p> | |
| | <p>Project Mgr: G.D.M.</p> | <p>Revision:</p> | |
| <p>File No. 06606J-A82</p> | | | |



850131233



850131234



LEGEND

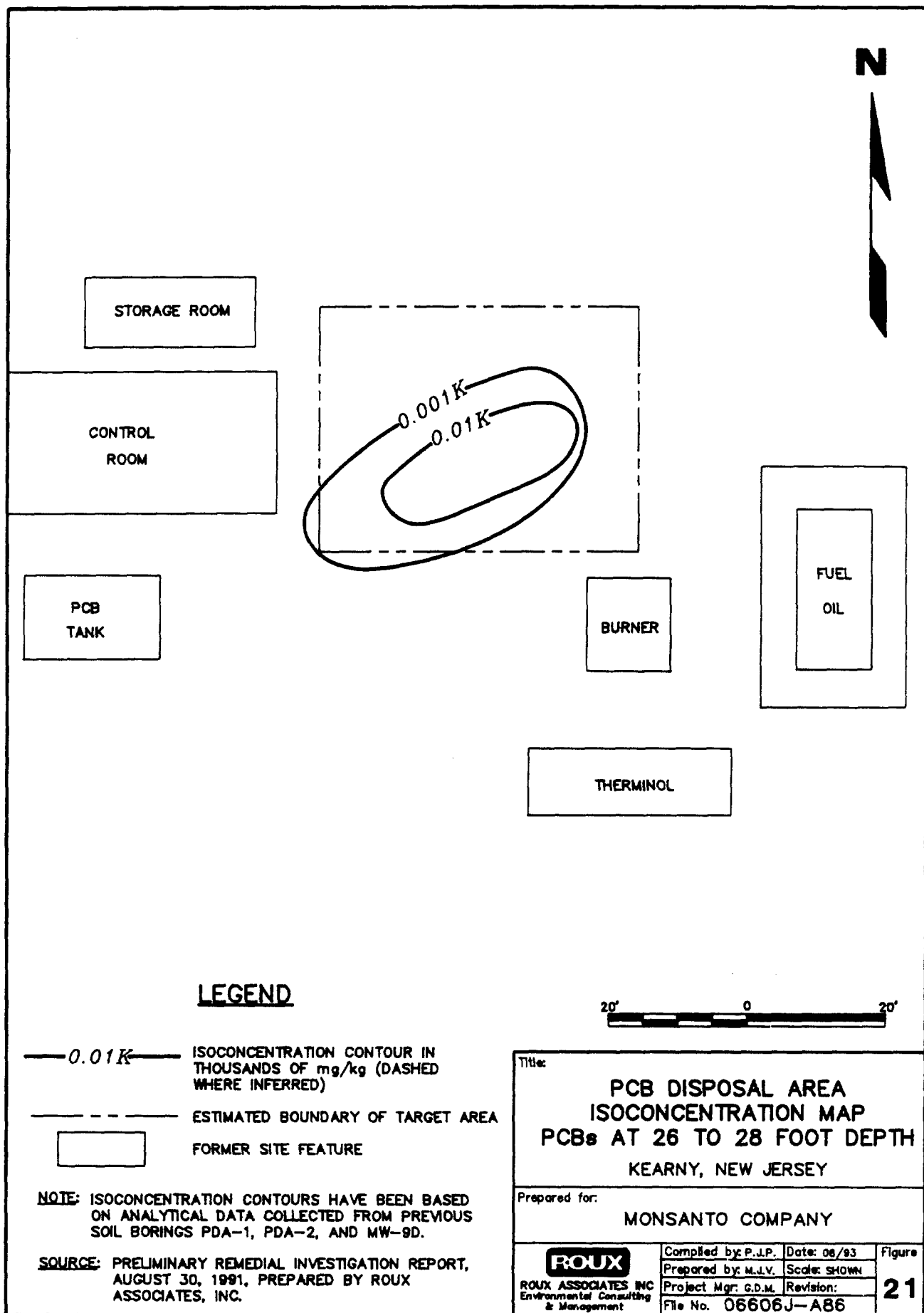
- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
 - - - - - ESTIMATED BOUNDARY OF TARGET AREA
 [] FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

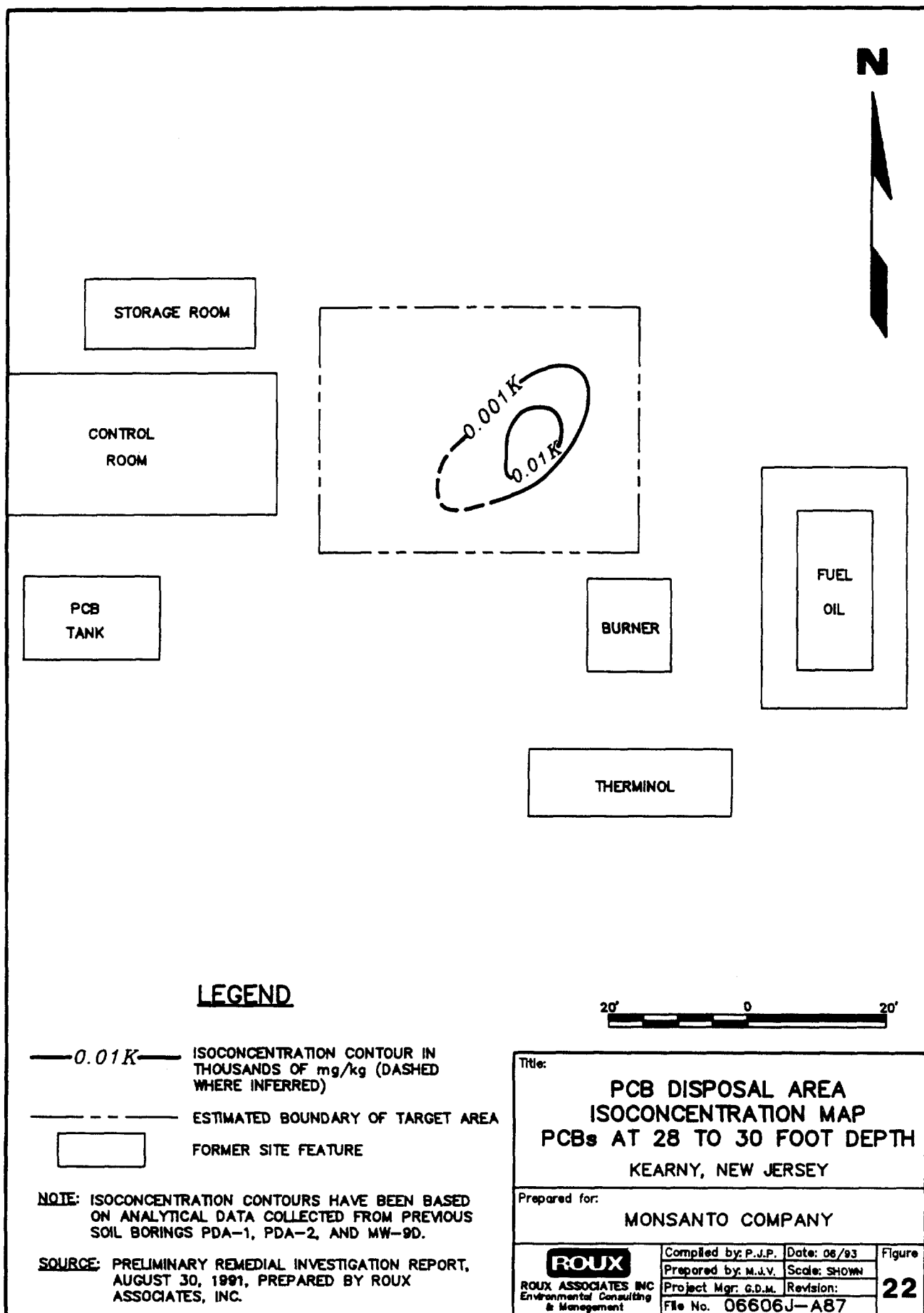
SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: | | | |
| PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 24 TO 26 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 06/93 | Figure
20 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A85 | | | |

850131235



850131236



LEGEND

- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
 - - - - - ESTIMATED BOUNDARY OF TARGET AREA
 [] FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

PCB DISPOSAL AREA
 ISOCONCENTRATION MAP
 PCBs AT 28 TO 30 FOOT DEPTH
 KEARNY, NEW JERSEY

Prepared for:

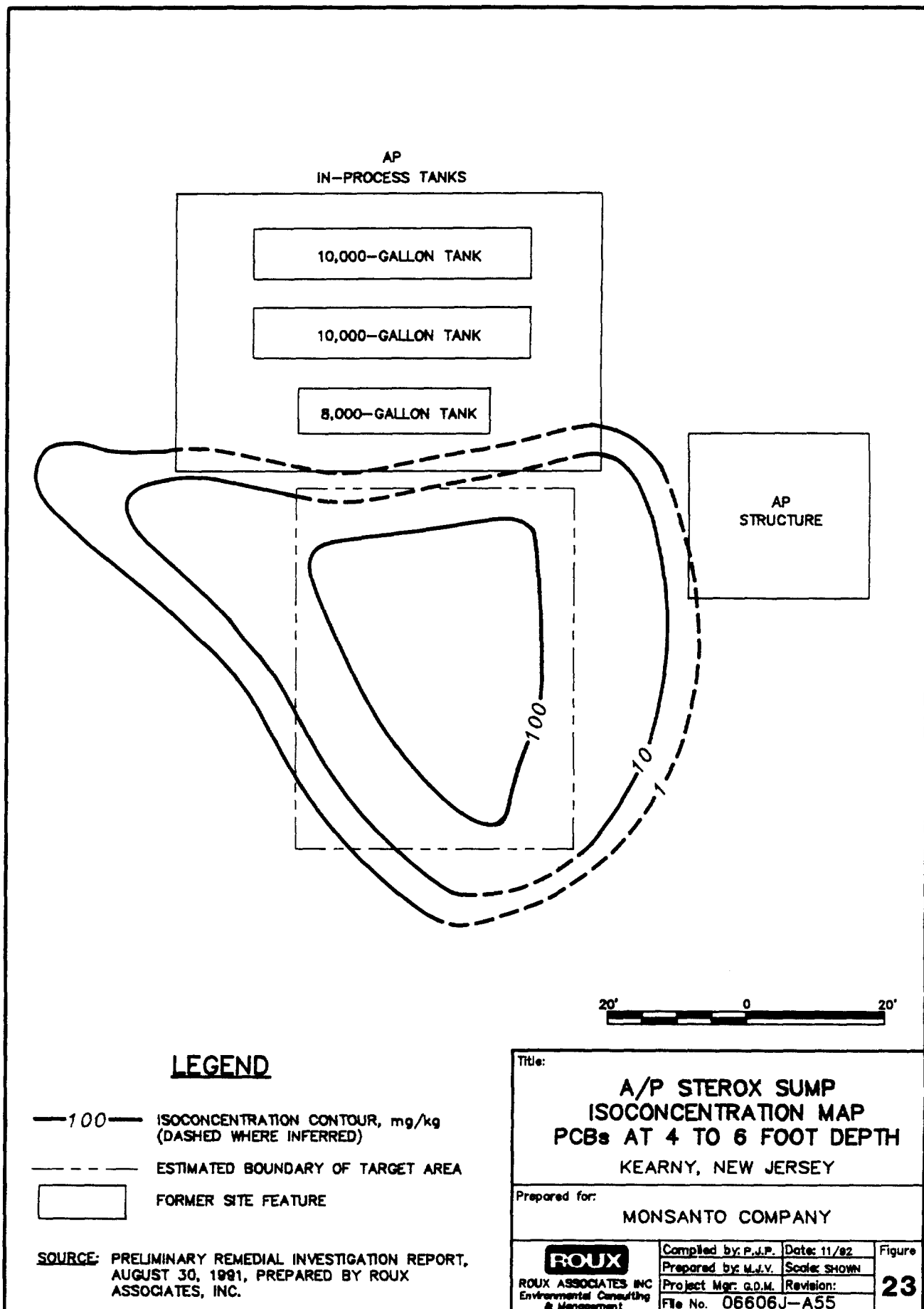
MONSANTO COMPANY

ROUX

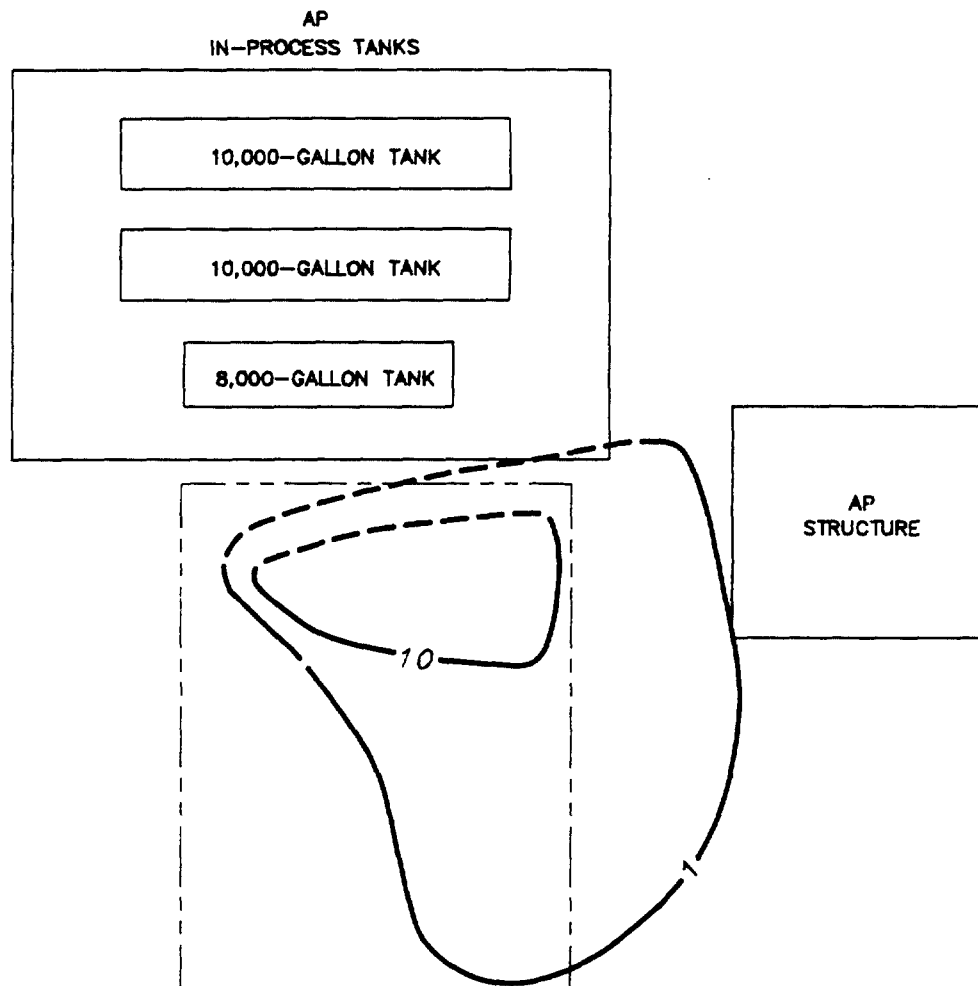
ROUX ASSOCIATES INC
 Environmental Consulting
 & Management

| | | |
|---------------------|--------------|---------------------|
| Compiled by: P.J.P. | Date: 06/93 | Figure
22 |
| Prepared by: M.J.V. | Scale: SHOWN | |
| Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A87 | | |

850131237



850131238



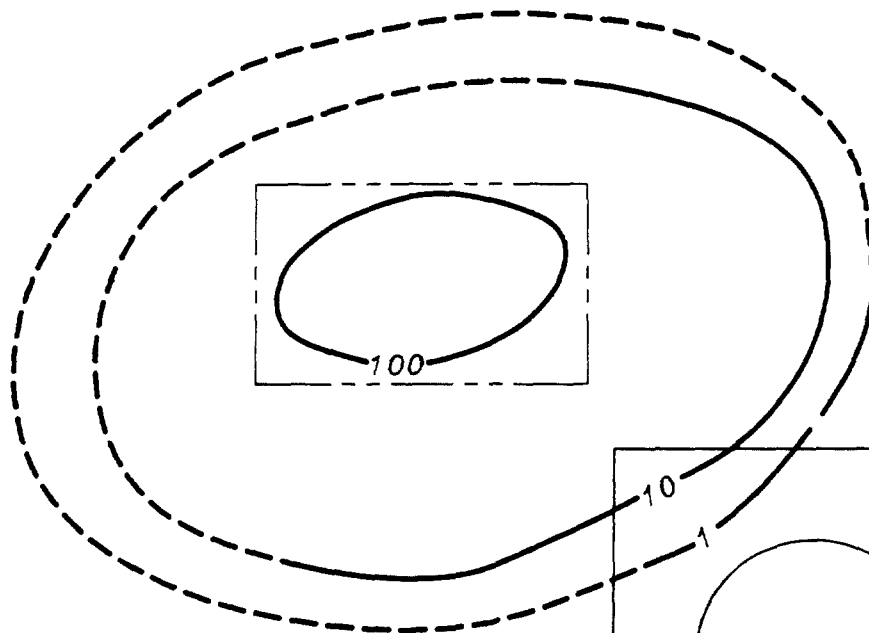
LEGEND

- 10 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

| | | | |
|---------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: | | | |
| A/P STEROX SUMP
ISOCONCENTRATION MAP
PCBs AT 9 TO 11 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
24 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: P.C.B. | Revision: | |
| File No. 06606J-A56 | | | |

STONE DIKE



LEGEND

- 100— ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

Title:

**SECONDARY SETTLING POND
ISOCONCENTRATION MAP
PCBs AT 4 TO 6 FOOT DEPTH
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

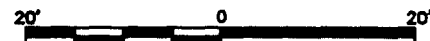
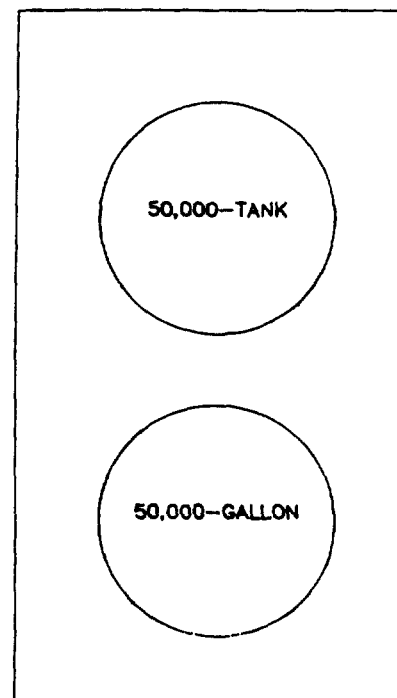
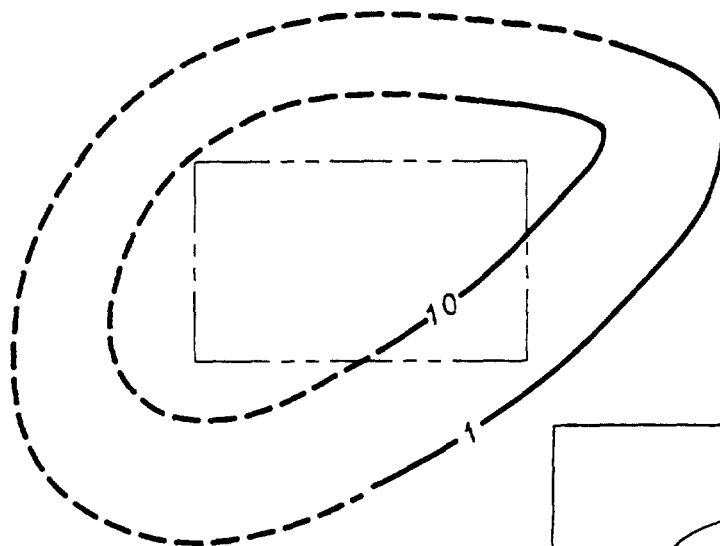
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | | |
|---------------------|--------------|---------------------|
| Compiled by: P.J.P. | Date: 11/92 | Figure
25 |
| Prepared by: M.J.V. | Scale: SHOWN | |
| Project Mgr: G.D.M. | Revision: | |


File No. 06606J-A57

850131240

STONE DIKE



LEGEND

- 10 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - - ESTIMATED BOUNDARY OF TARGET AREA
-  FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

Title:

**SECONDARY SETTLING POND
ISOCONCENTRATION MAP
PCBs AT 9 TO 11 FOOT DEPTH
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

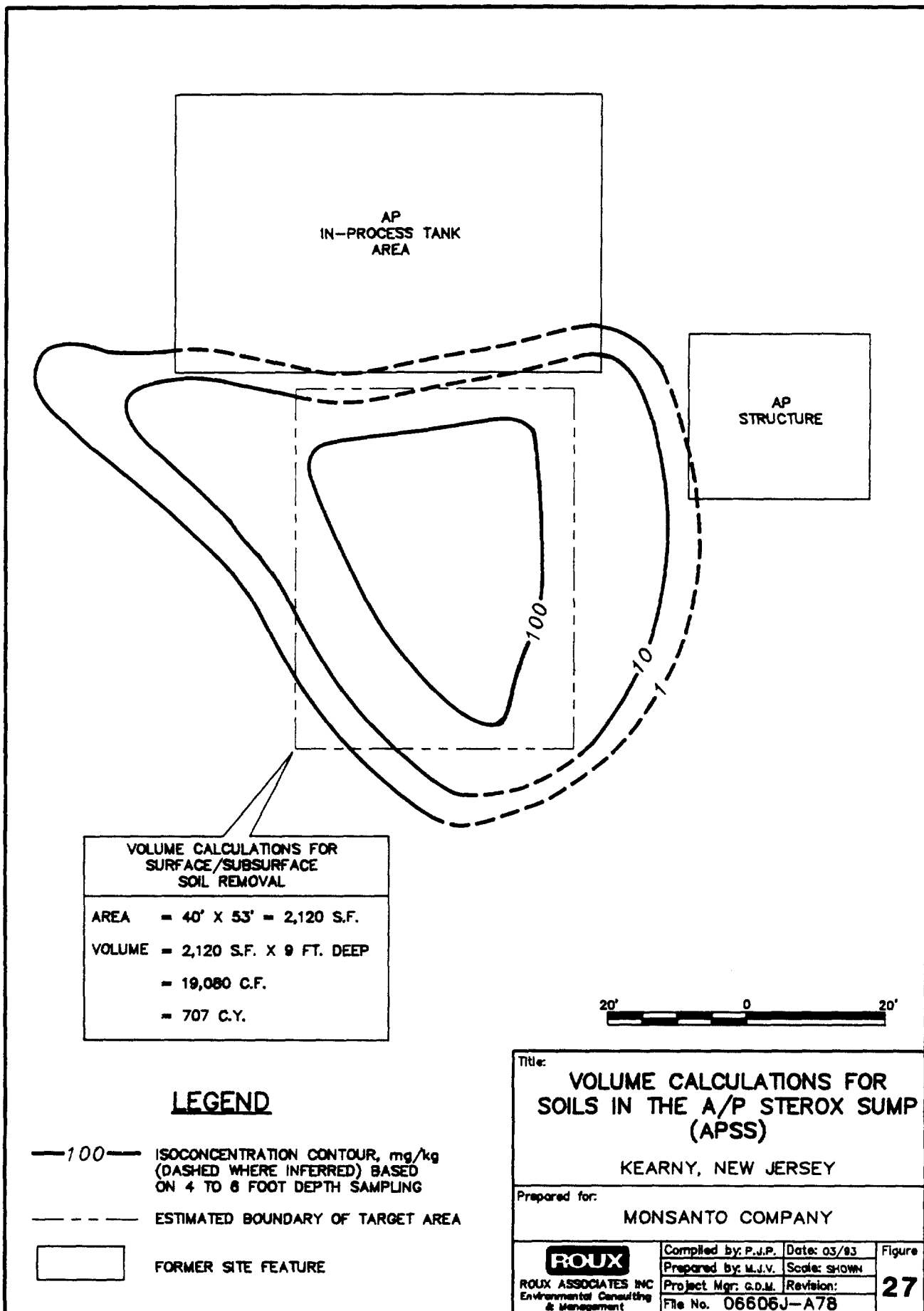
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|--------------|
| Compiled by: P.J.P. | Date: 11/92 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A58 | |

Figure

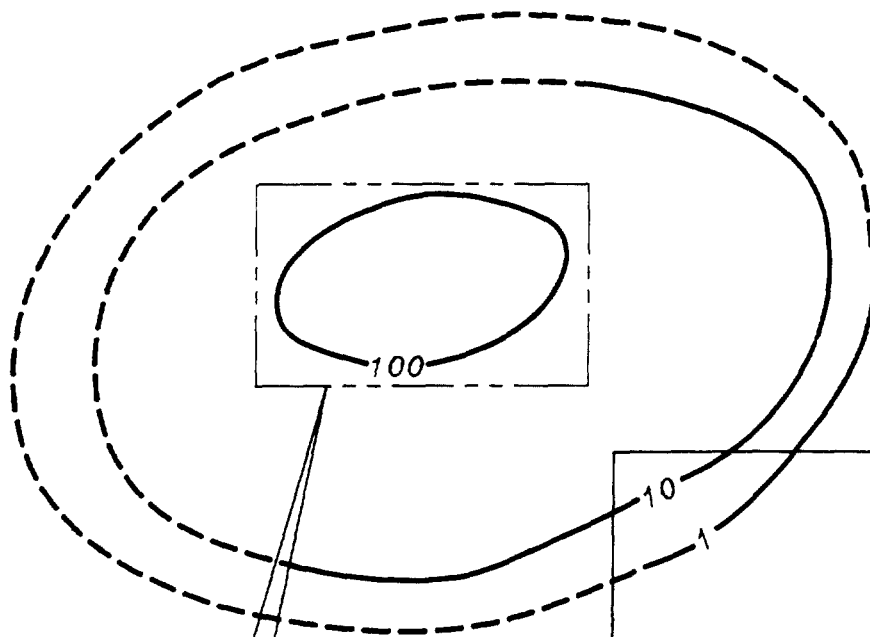
26

850131241



850131242

STONE DIKE



STORAGE
TANK
AREA

| VOLUME CALCULATIONS FOR
SURFACE/SUBSURFACE
SOIL REMOVAL | |
|---------------------------------------------------------------|-------------------------|
| AREA | = 21' X 34' = 714 S.F. |
| VOLUME | = 714 S.F. X 9 FT. DEEP |
| | = 6,426 C.F. |
| | = 238 C.Y. |



LEGEND

- 100— ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED) BASED ON
4 TO 6 FOOT DEPTH SAMPLING
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

Title:

VOLUME CALCULATIONS FOR SOILS IN THE SECONDARY SETTLING POND (SSP)

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

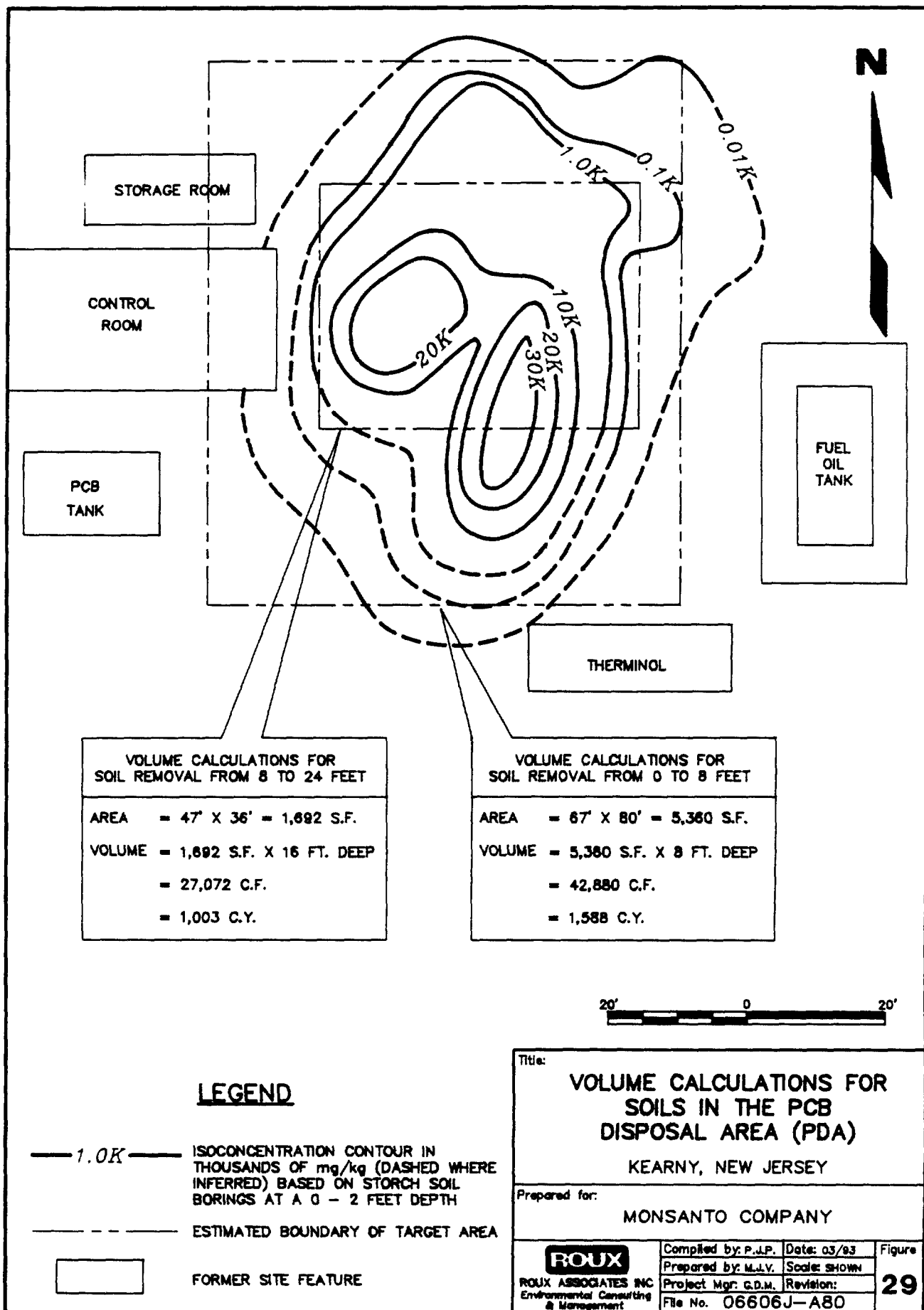
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|--------------|
| Compiled by: P.J.P. | Date: 03/93 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A79 | |

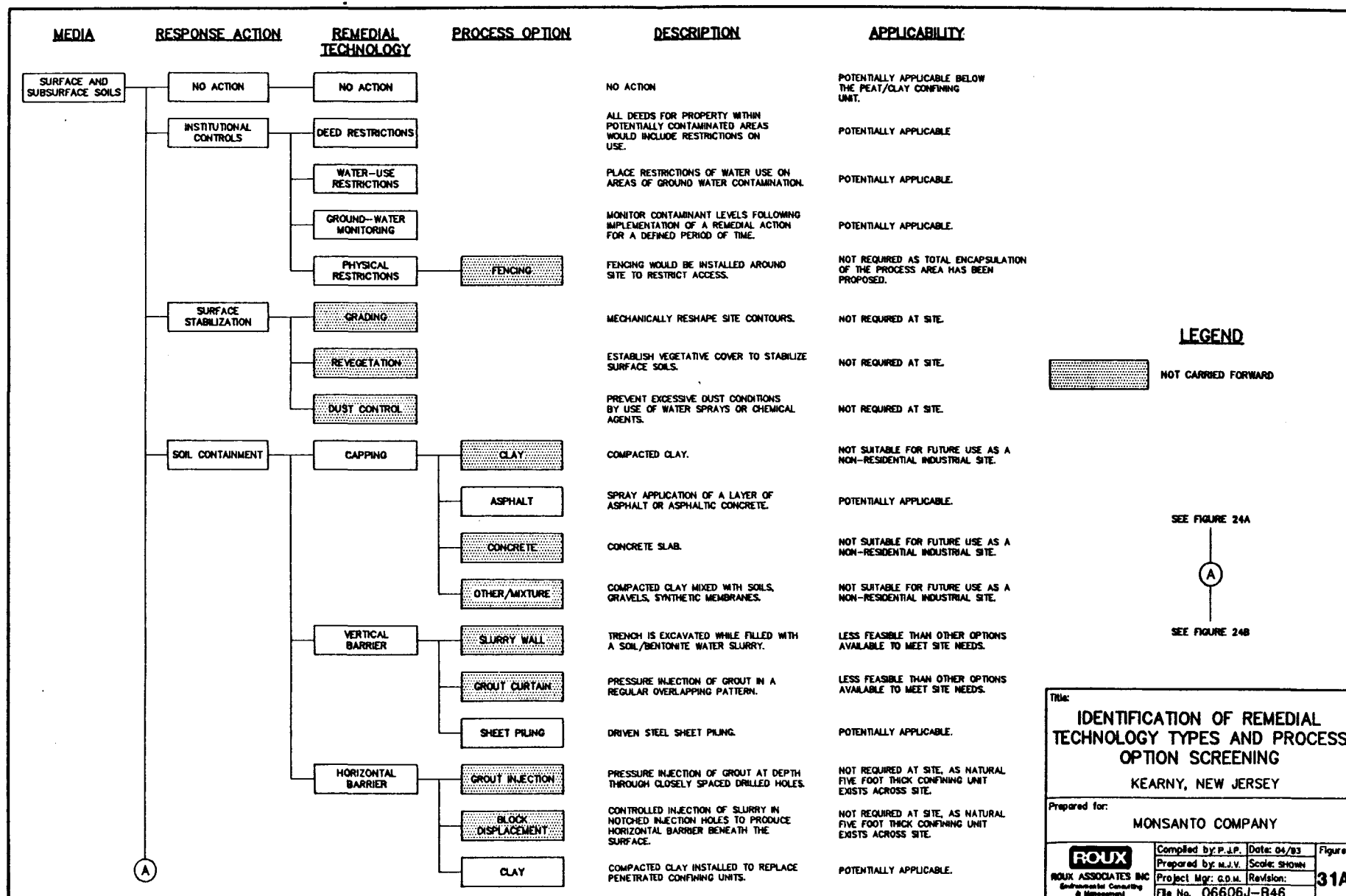
Figure

28

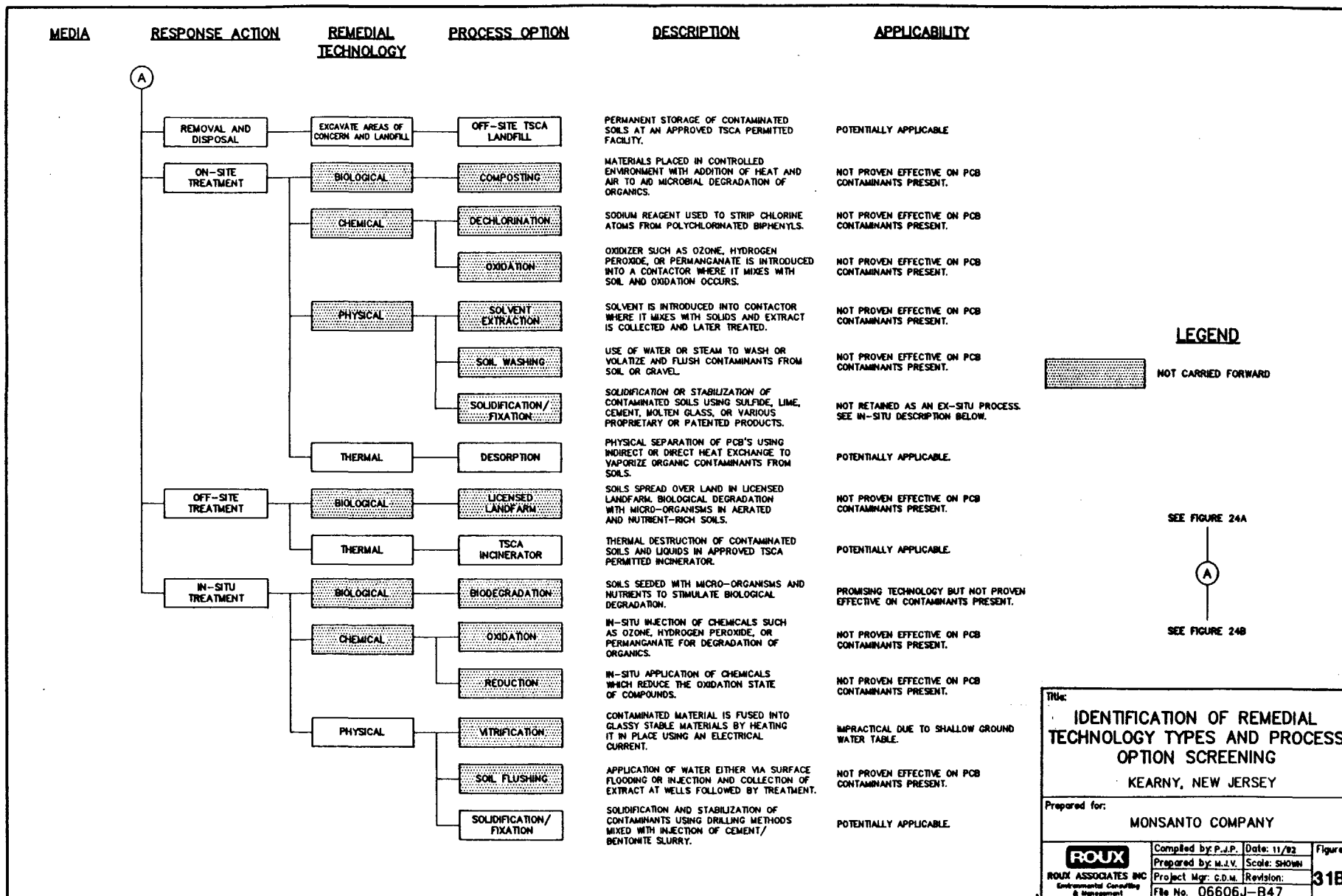
850131243



850131244



850131246



LEGEND



NOT CARRIED FORWARD

SEE FIGURE 24A

A

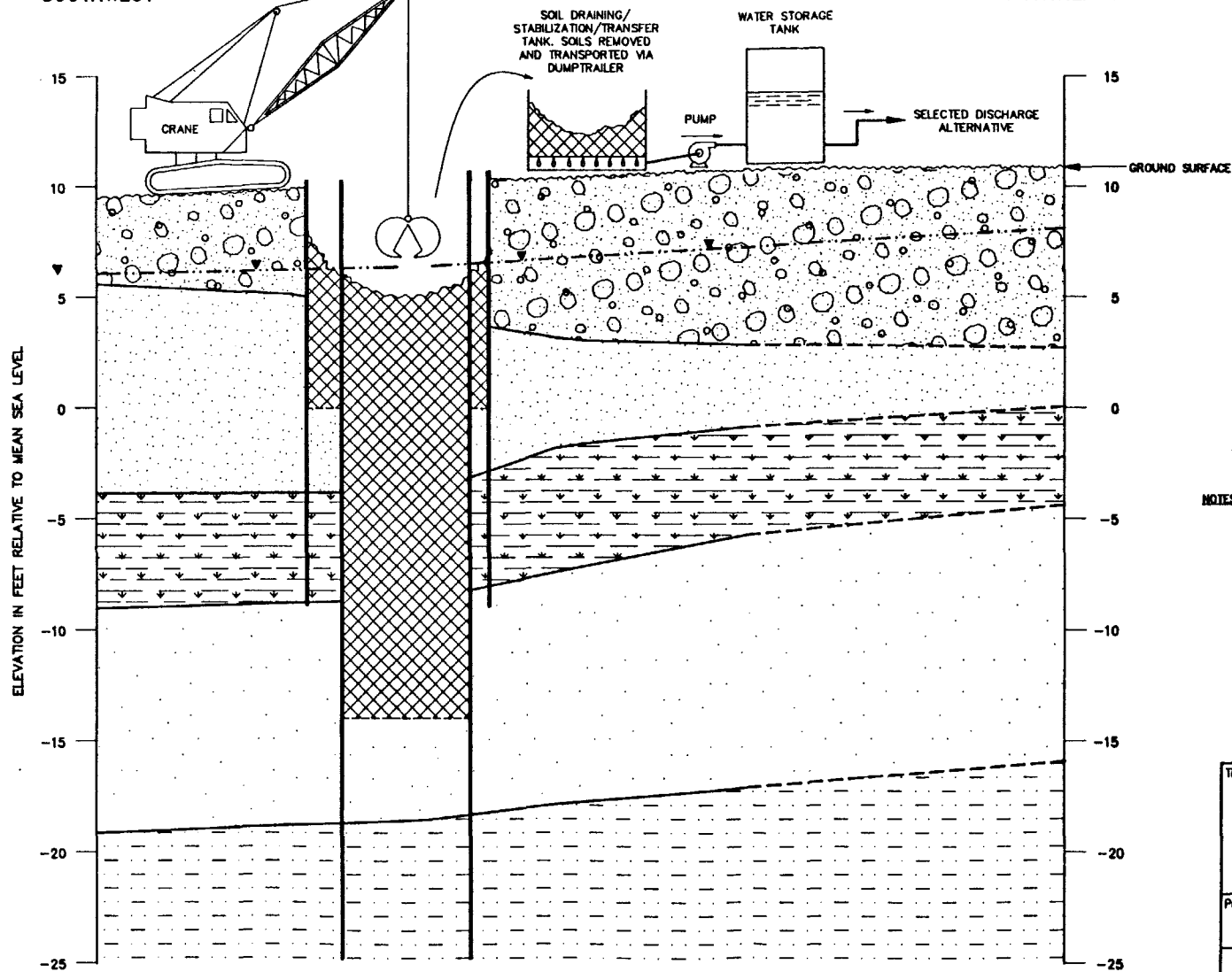
SEE FIGURE 24B

| | | | |
|-------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------|
| IDENTIFICATION OF REMEDIAL TECHNOLOGY TYPES AND PROCESS OPTION SCREENING
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
31B |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: C.D.M. | Revision: | |
| | File No. 06606J-B47 | | |

850131247

SOUTHWEST

NORTHEAST

**LEGEND**

SHEET PILING

WATER-TABLE (MARCH-APRIL, 1991)

LITHOLOGIC BOUNDARY BETWEEN
UNITS (DASHED WHERE INFERRED)

ANTICIPATED BOTTOM OF EXCAVATION



FILL

SILTY MEDIUM TO COARSE SAND

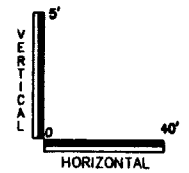
PEAT AND CLAY

COARSE SAND

SILT AND CLAY

SOILS TO BE REMOVED

NOTES: GEOLOGICAL CONDITIONS TAKEN FROM CROSS-SECTION
A - A' ON FIGURE 8 IN THE MONITY OF PDA.
SCALE ONLY APPLIES TO GEOLOGIC INFORMATION.



Title:

CONCEPTUAL SOIL REMOVAL OPERATIONS IN PDA

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

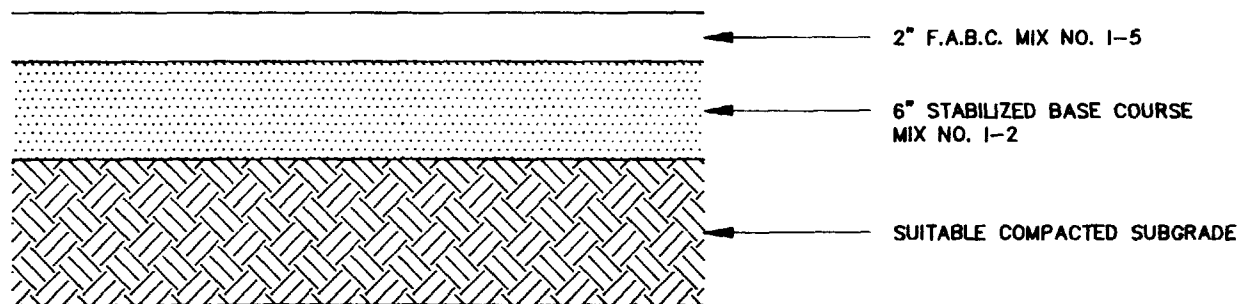
ROUX
ROUX ASSOCIATES INC.
Environmental Consulting
& Management

Compiled by: P.J.P. Date: 04/93
Prepared by: M.J.V. Scale: SHOWN
Project Mgr: G.D.M. Revision:
File No. 06606J-B40

Figure

32

850131248



MATERIALS

1. GENERAL: MATERIALS AND MIXTURES SHALL COMPLY WITH SECTION 304 AND SECTION 404 OF THE NEW JERSEY STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS.
2. FABC SURFACE COURSE AND LEVEL COURSE:
A. MIXTURE: MIX NO. 1-5, TABLE 903-1
3. BITUMINOUS STABILIZED BASE MATERIAL:
A. MIXTURE: MIX NO. 1-2, STONE MIX, TABLE 903-1
4. JOB MIX FORMULA WILL BE PROVIDED FOR EACH REQUIRED BITUMINOUS AGGREGATE MIXTURE AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

Title:

VERTICAL CROSS-SECTION SHOWING PROPOSED ASPHALT CAP DETAIL

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: P.J.P.

Date: 11/92

Figure

Prepared by: M.J.V.

Scale: SHOWN

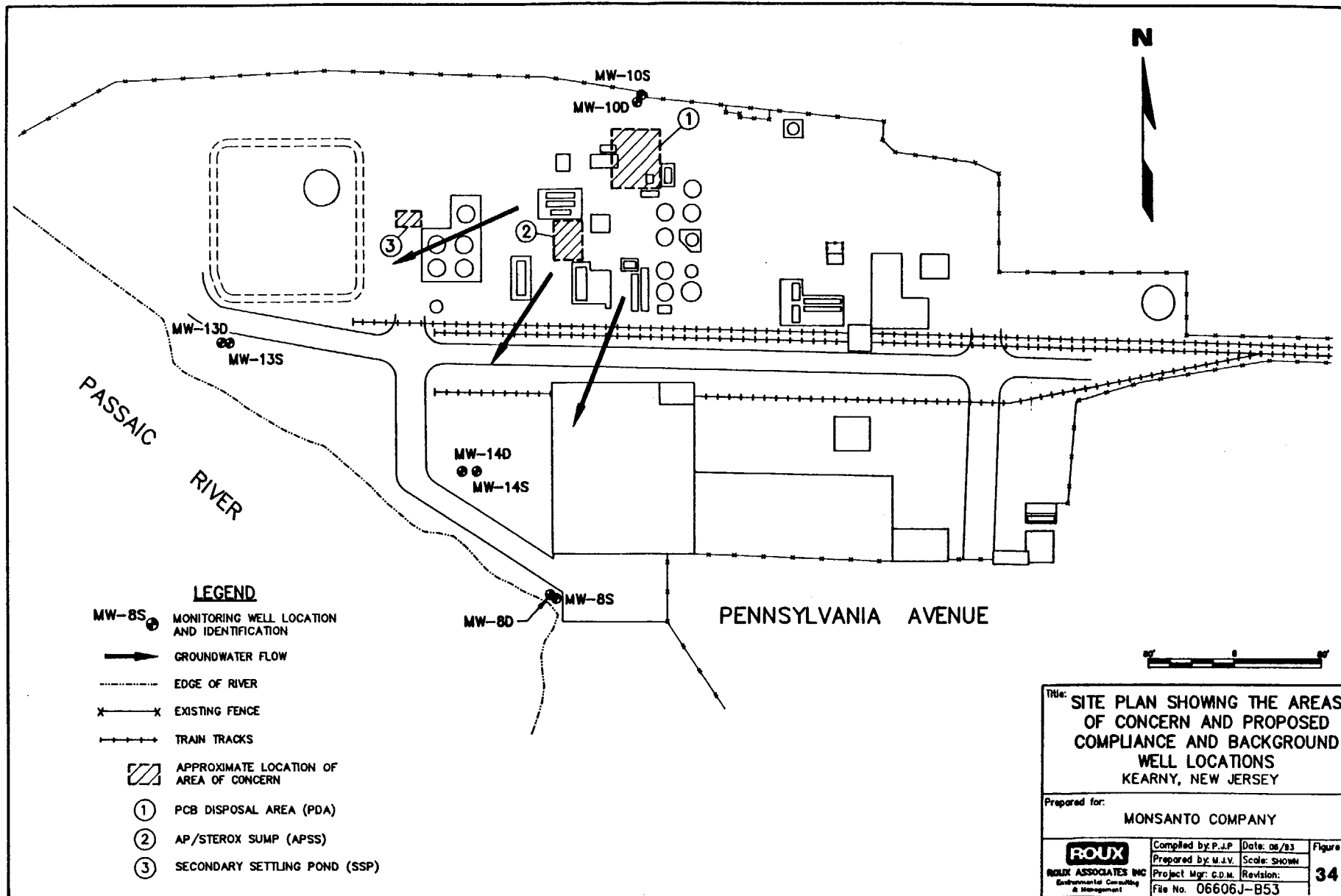
Project Mgr: C.O.M.

Revision:

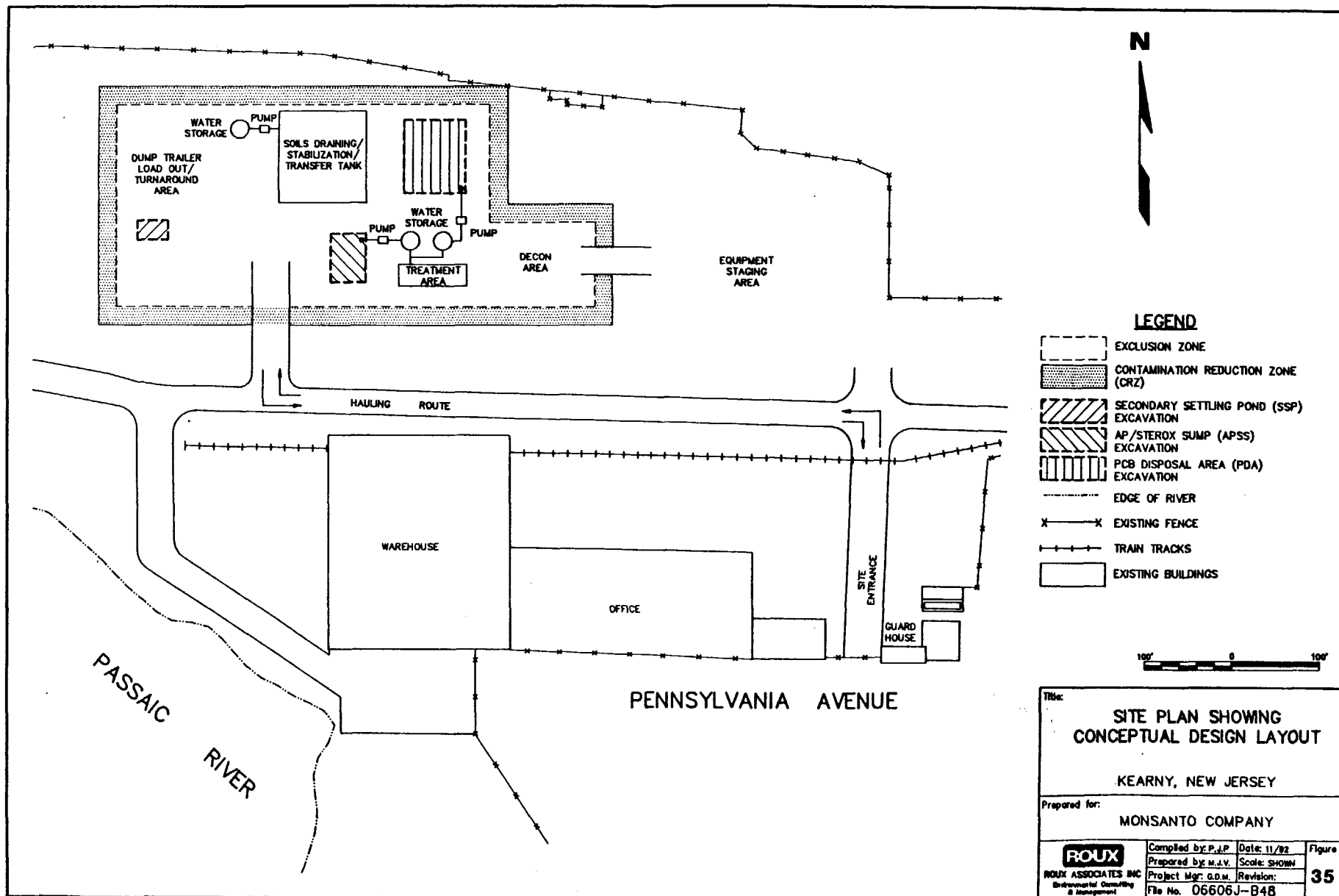
File No. 06606J-A53

33

850131249



850131250




| | | | |
|---------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: | | | |
| SITE PLAN SHOWING
CONCEPTUAL DESIGN LAYOUT | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC.
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
35 |
| | Prepared by: M.S.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| | File No. 06606J-B48 | | |

850131251

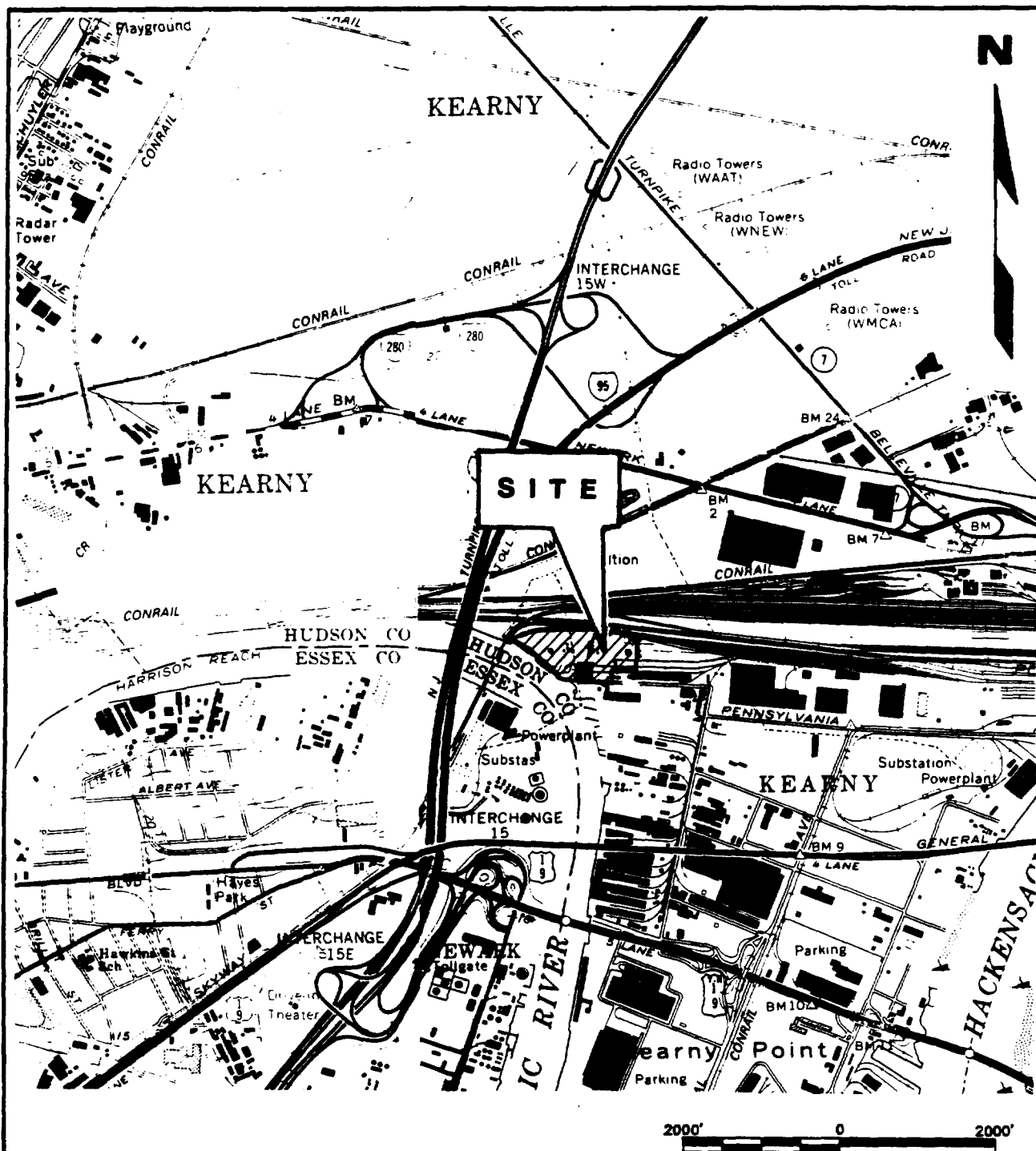
| TASK DESCRIPTION | ESTIMATED TIME TO COMPLETE TASK (WEEKS) | | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1. INSTALL SHEET-PIILING IN ALL AOCS. | | | | | | | | | | | | | | |
| 2. INSTALL AND OPERATE DEWATERING EQUIPMENT. | | | | | | | | | | | | | | |
| 3. MOBILIZE ALL NECESSARY EXCAVATION EQUIPMENT, HOLDING TANKS, AND TREATMENT EQUIPMENT. | | | | | | | | | | | | | | |
| 4. EXCAVATION AND BACKFILLING OF SURFACE AND SUBSURFACE SOILS. | | | | | | | | | | | | | | |
| 5. POST TREATMENT AND DISPOSAL OF SOILS AND WATER. | | | | | | | | | | | | | | |
| 6. DECONTAMINATION AND DEMOBILIZATION OF REMOVAL OPERATION EQUIPMENT. | | | | | | | | | | | | | | |
| 7. SITE RESTORATION AND ASPHALT ENCAPSULATION. | | | | | | | | | | | | | | |

■ ANTICIPATED TASK COMPLETION TIME

NOTE: A MORE DETAILED SCHEDULE OF CONSTRUCTION, OPERATION AND MAINTENANCE ACTIVITIES WILL BE INCLUDED IN THE REMEDIAL ACTION PLAN.

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|---------------------|
| Title: | | | |
| PRELIMINARY SCHEDULE OF
FIELD ACTIVITIES | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| 
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
36 |
| | Prepared by: M.L.V. | Scale: NONE | |
| | Project Mgr: G.O.W. | Revision: | |
| | File No. 06606J-B51 | | |

850131252



SOURCE: U.S.G.S. ORANGE, N.J., QUADRANGLE 1955
 U.S.G.S. ELIZABETH, N.J., QUADRANGLE 1967
 U.S.G.S. WEEHAWKEN, N.J., QUADRANGLE 1967
 U.S.G.S. JERSEY CITY, N.J., QUADRANGLE 1967
 7.5 MINUTES SERIES (TOPOGRAPHIC)
 PHOTOREVISED 1981

| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------------------------------|
| TITLE:
<h2 style="text-align: center;">SITE LOCATION MAP</h2> <h3 style="text-align: center;">KEARNY PLANT
KEARNY, NEW JERSEY</h3> | | | |
| Prepared for:
<h3 style="text-align: center;">MONSANTO COMPANY</h3> | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/82 | Figure
<h1 style="font-size: 2em;">1</h1> |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J | | | |

850131253

850131254

PASSAIC
RIVER

PENNSYLVANIA
AVENUE

N

LEGEND

- EDGE OF RIVER
- X---X EXISTING FENCE
- +---+ TRAIN TRACKS
- NU NOT IN USE

100' 0 100'

Title:

SITE PLAN PRIOR TO DEMOLITION
OF PROCESS AREAS

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

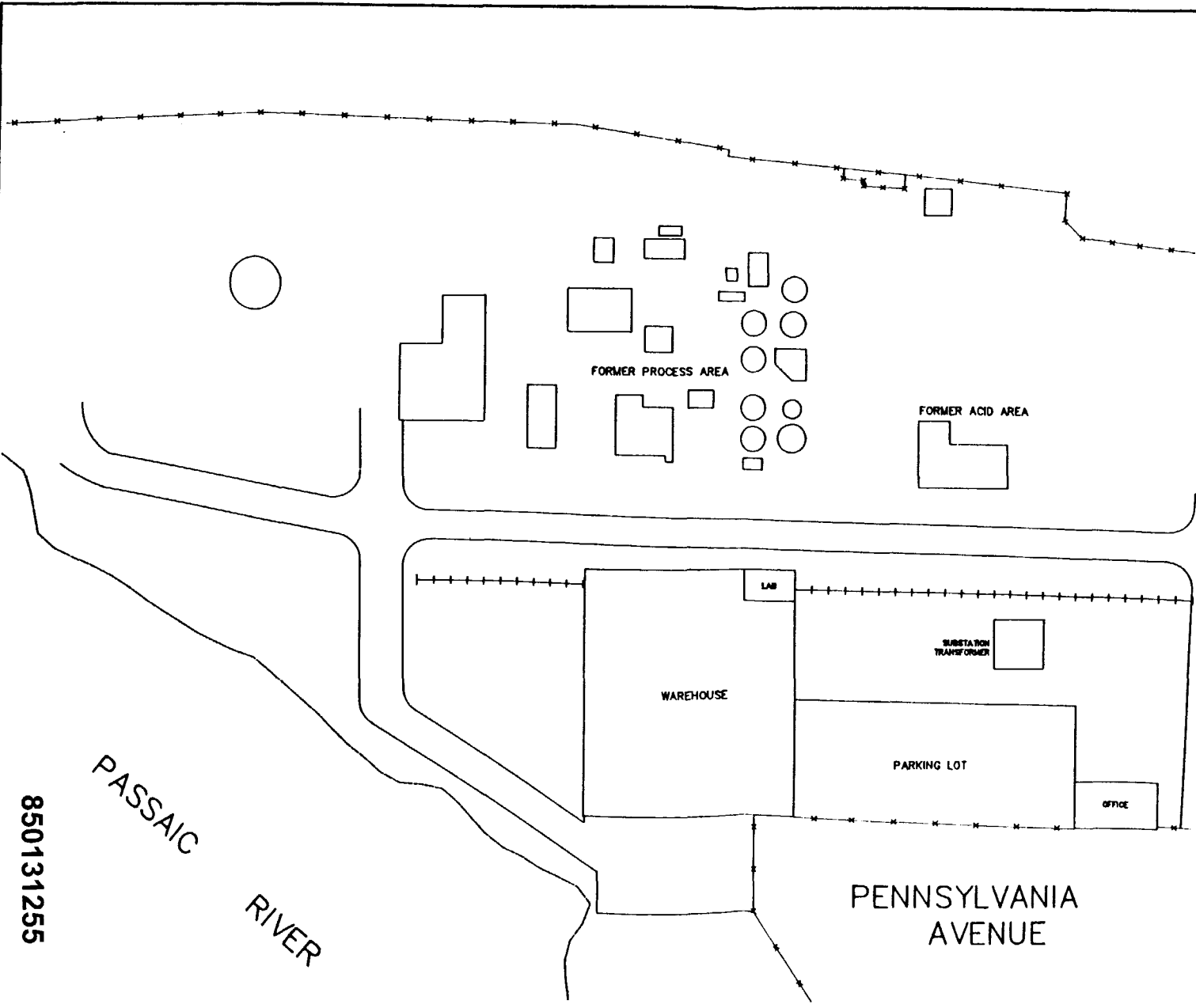
ROUX
ROUX ASSOCIATES INC.
Environmental Consulting
& Management

Compiled by: P.J.P. Date: 11/82
Prepared by: M.J.V. Scale: SHOWN
Project Mgr: G.O.M. Revision:
File No. 06606J-B41

Figure

2

N



LEGEND

- EDGE OF RIVER
- X-----X EXISTING FENCE
- +-----+ TRAIN TRACKS
- CONCRETE FOUNDATION

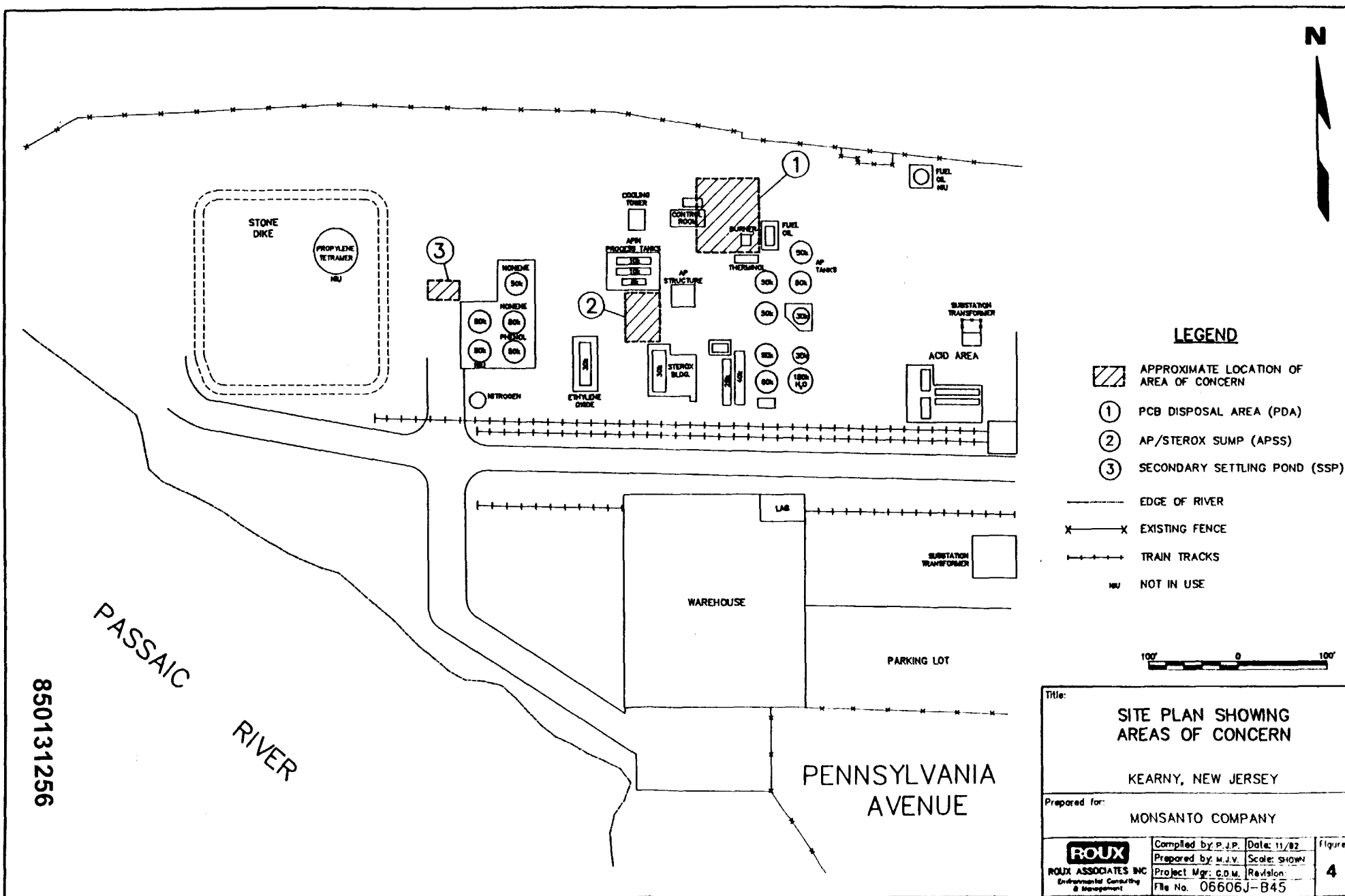
100' 0 100'

| | | | |
|--------------------------------------------------------------------------------|---------------------|--------------|--------------------|
| Title: | | | |
| SITE PLAN FOLLOWING DEMOLITION
OF PROCESS AREAS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
3 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| | File No: 06606J-B42 | | |

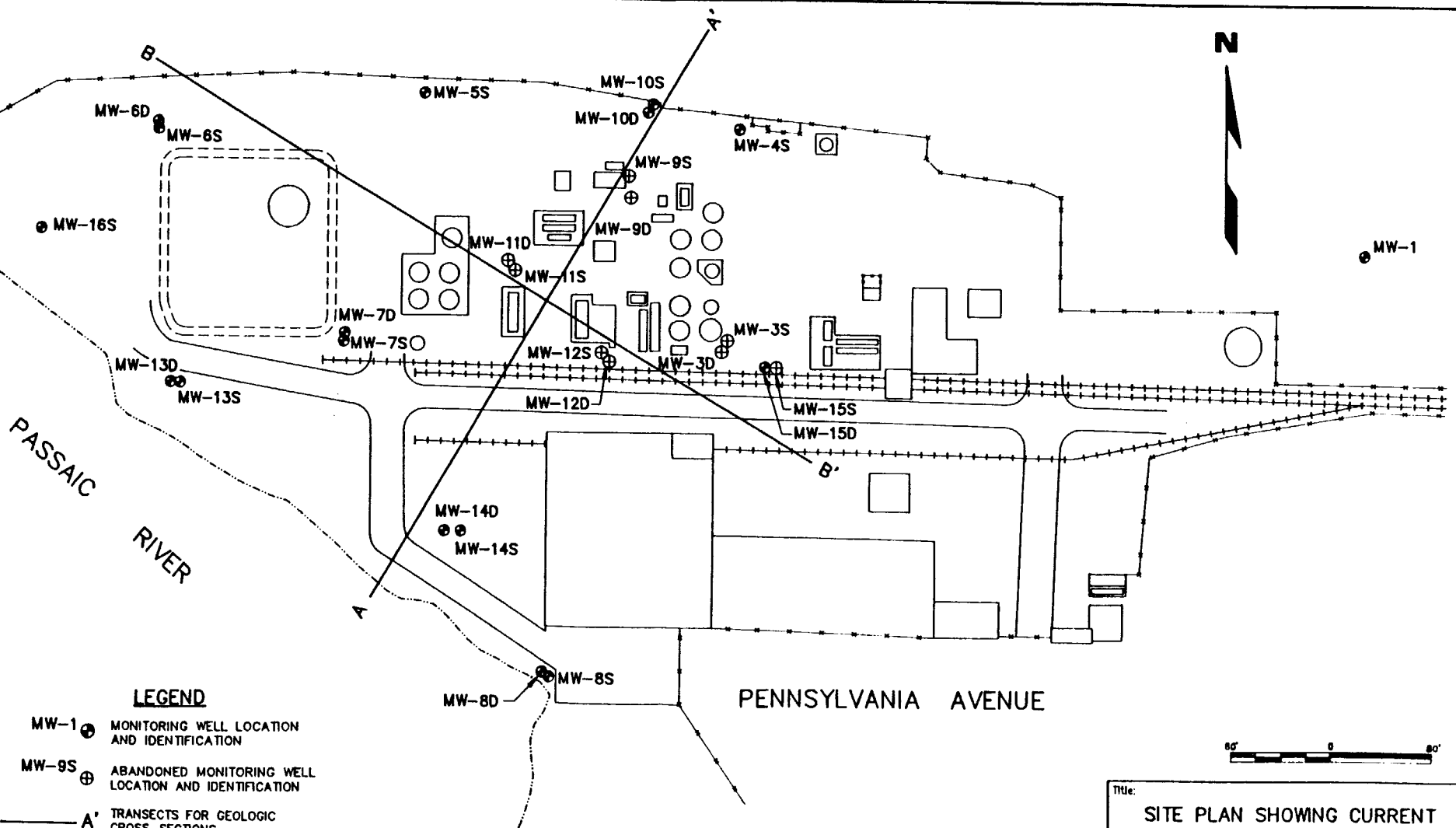
850131255

PASSAIC
RIVER

PENNSYLVANIA
AVENUE

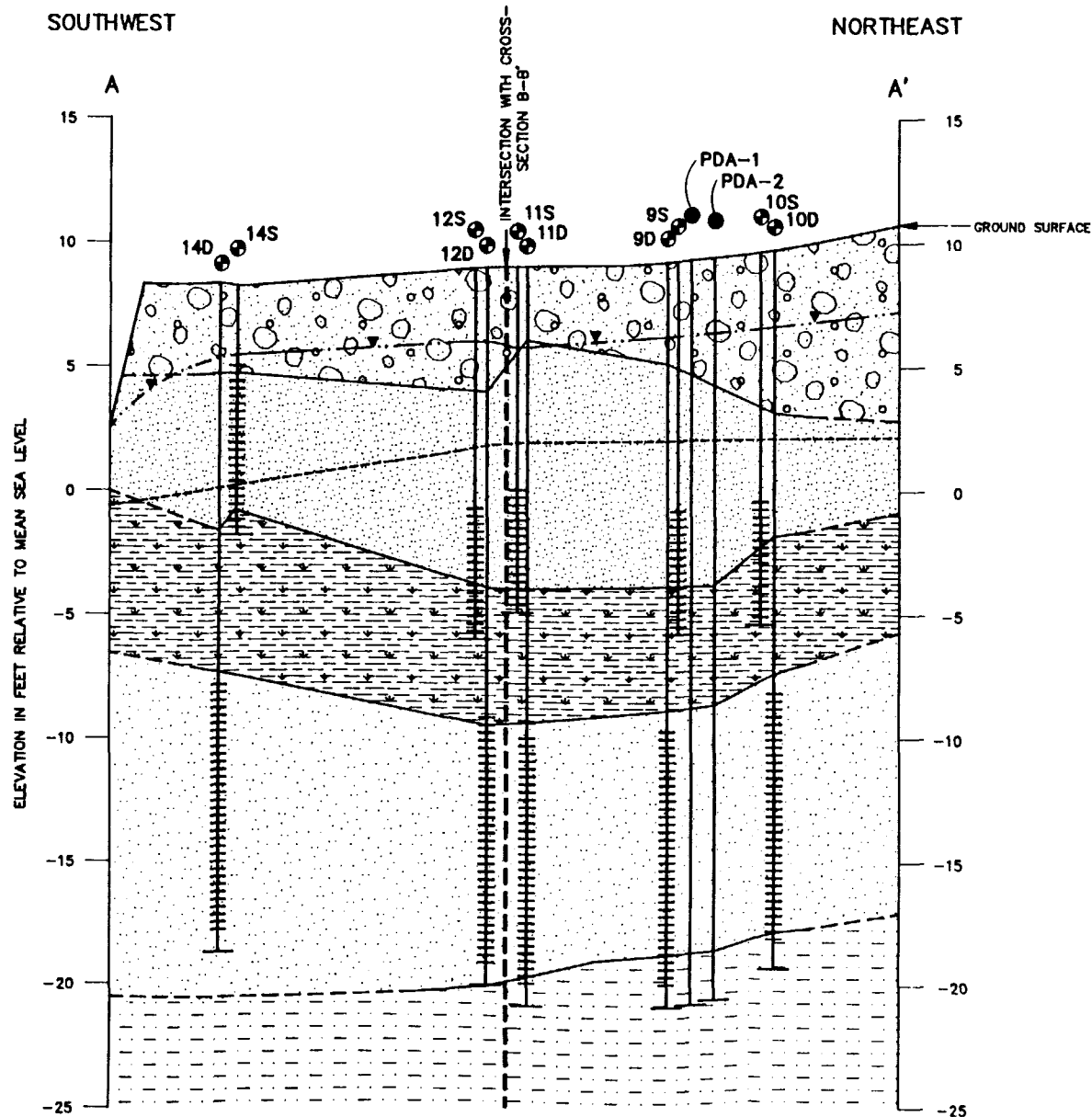


850131257



| | | | |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------|--------------------|
| TITLE:
SITE PLAN SHOWING CURRENT
AND FORMER MONITORING WELL
LOCATIONS
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by P.J.P.
Prepared by M.J.V.
Project Mgr. G.D.W. | Date: 11/82
Scale: SHOWN
Revision | Figure
5 |
| File No. 06606J-B44 | | | |

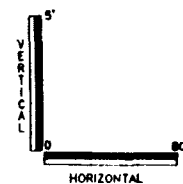
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LEGEND

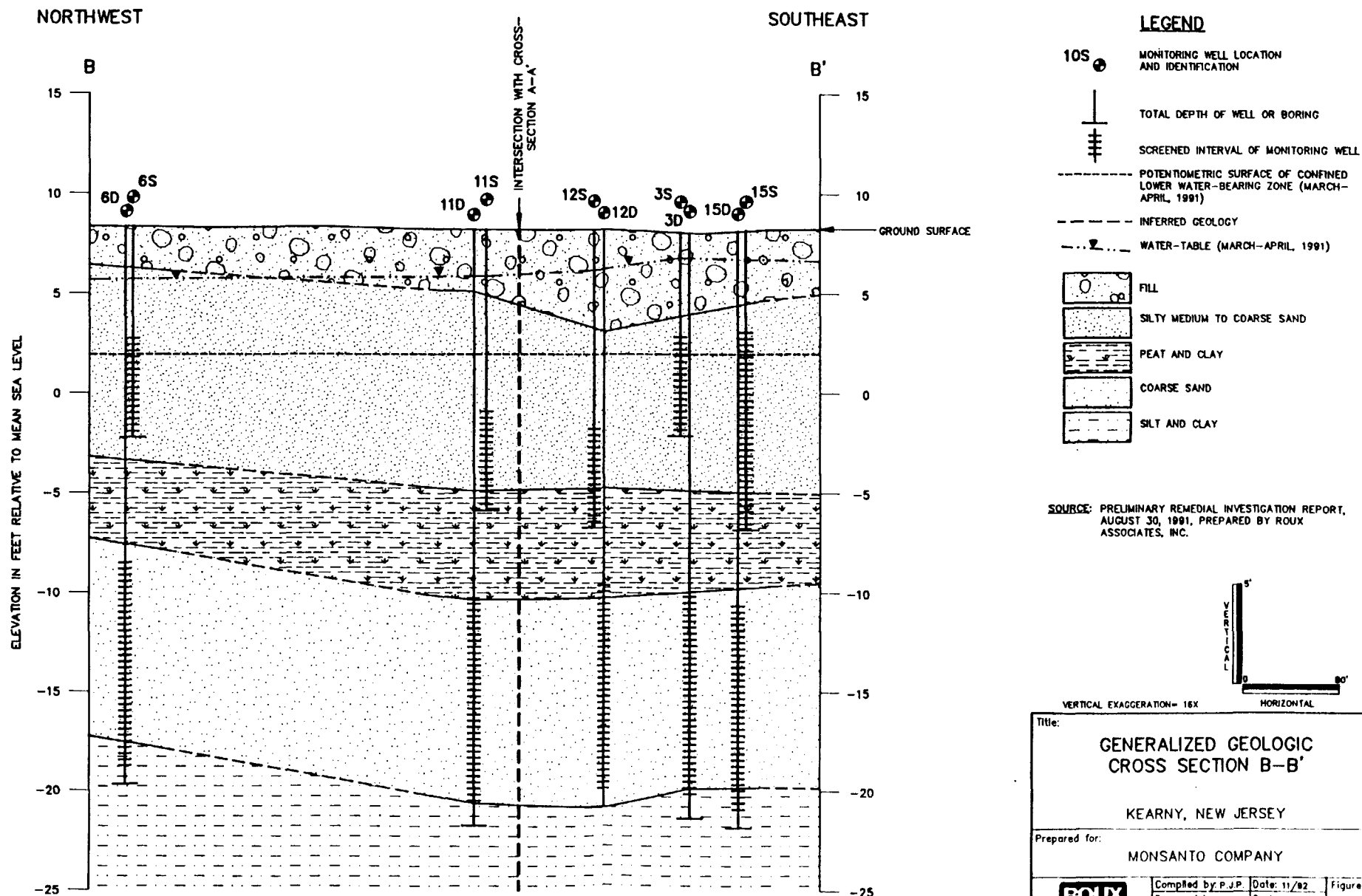
- 10S ● MONITORING WELL LOCATION AND IDENTIFICATION
- PDA-1 ● SOIL BORING LOCATION AND IDENTIFICATION
- TOTAL DEPTH OF WELL OR BORING
- SCREENED INTERVAL OF MONITORING WELL
- - - - POTENTIOMETRIC SURFACE OF CONFINED LOWER WATER-BEARING ZONE (MARCH-APRIL, 1991)
- - - - INFERRED GEOLOGY
- · - · - WATER-TABLE (MARCH-APRIL, 1991)
- FILL
- SILTY MEDIUM TO COARSE SAND
- PEAT AND CLAY
- COARSE SAND
- SILT AND CLAY

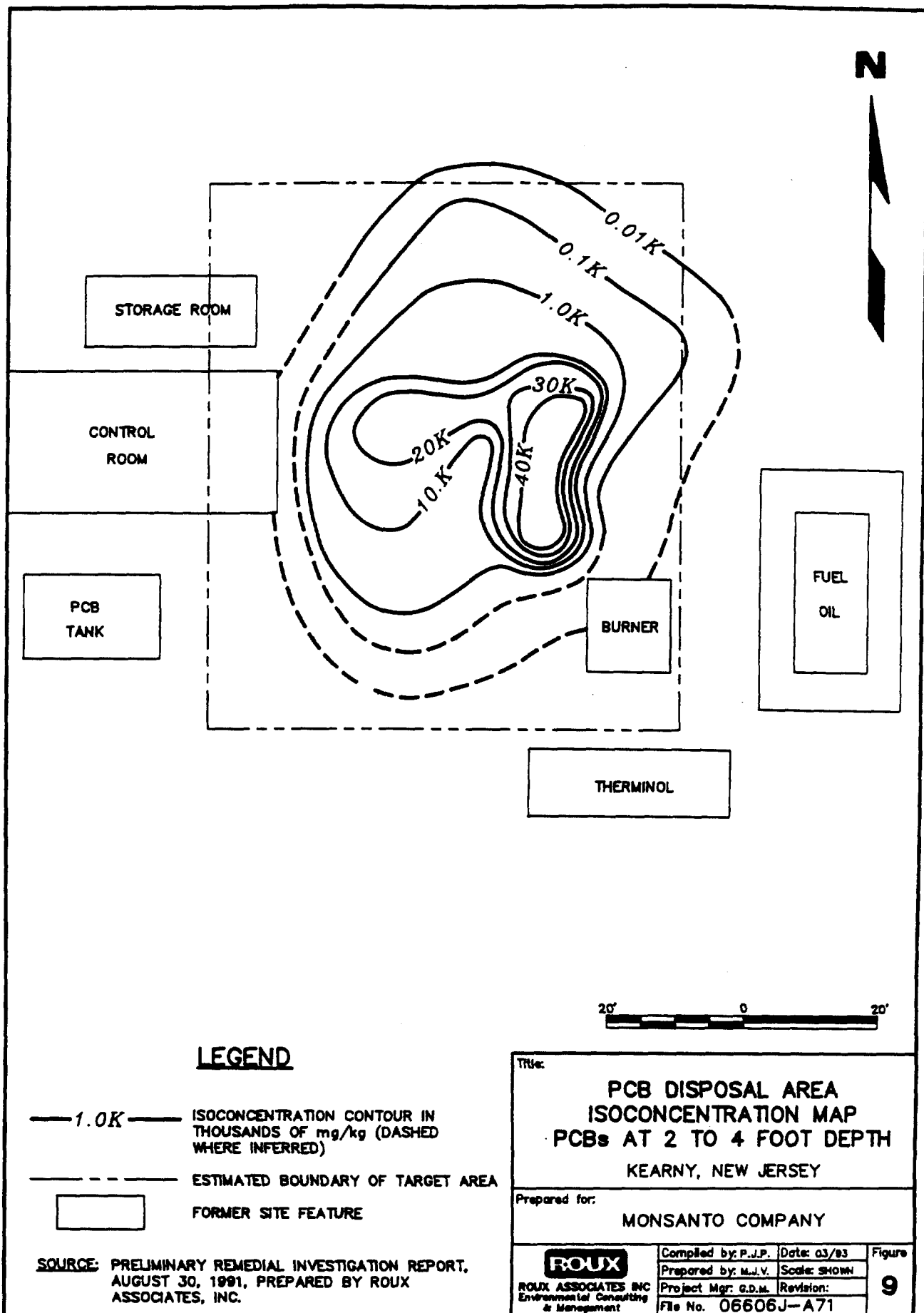
SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.



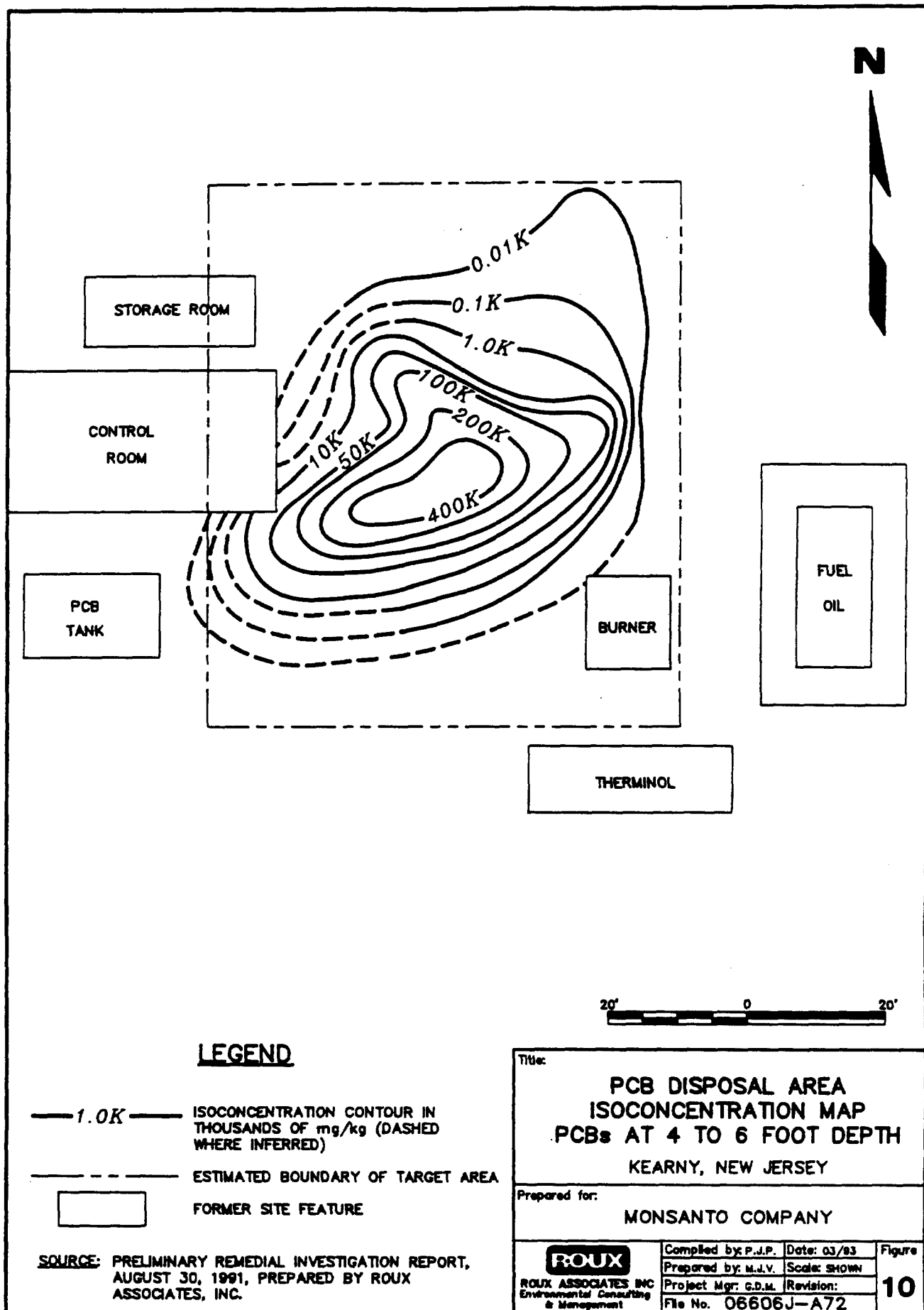
| | | | |
|-------------------------------------------------------------------|---------------------|--------------|--------|
| Title: | | | |
| GENERALIZED GEOLOGIC CROSS SECTION A-A' | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
|
ROUX ASSOCIATES INC.
Environmental Consulting & Management | Compiled by: P.J.P. | Date: 11/92 | Figure |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision | |
| | File No: 06606J-B49 | | |

850131259

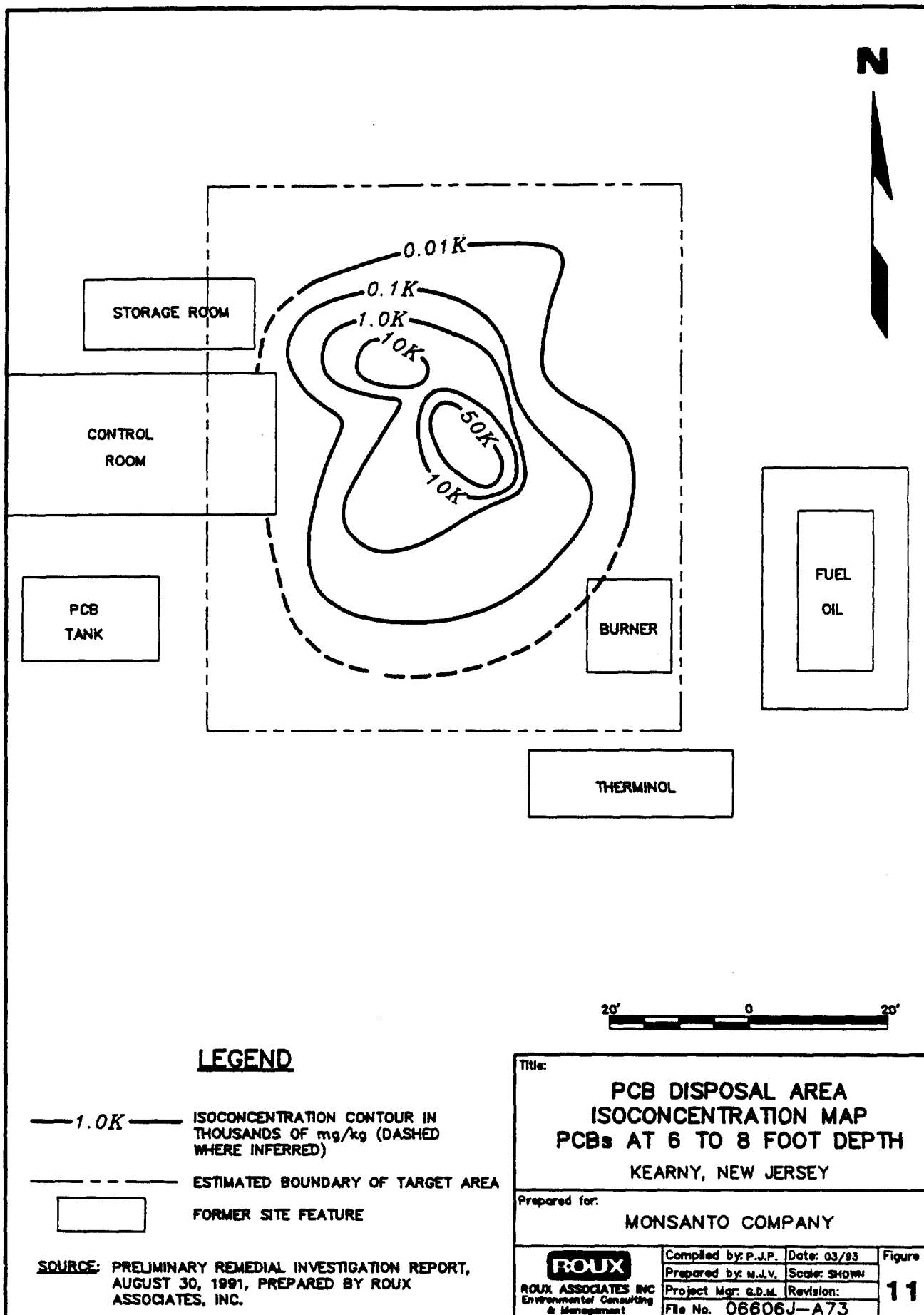




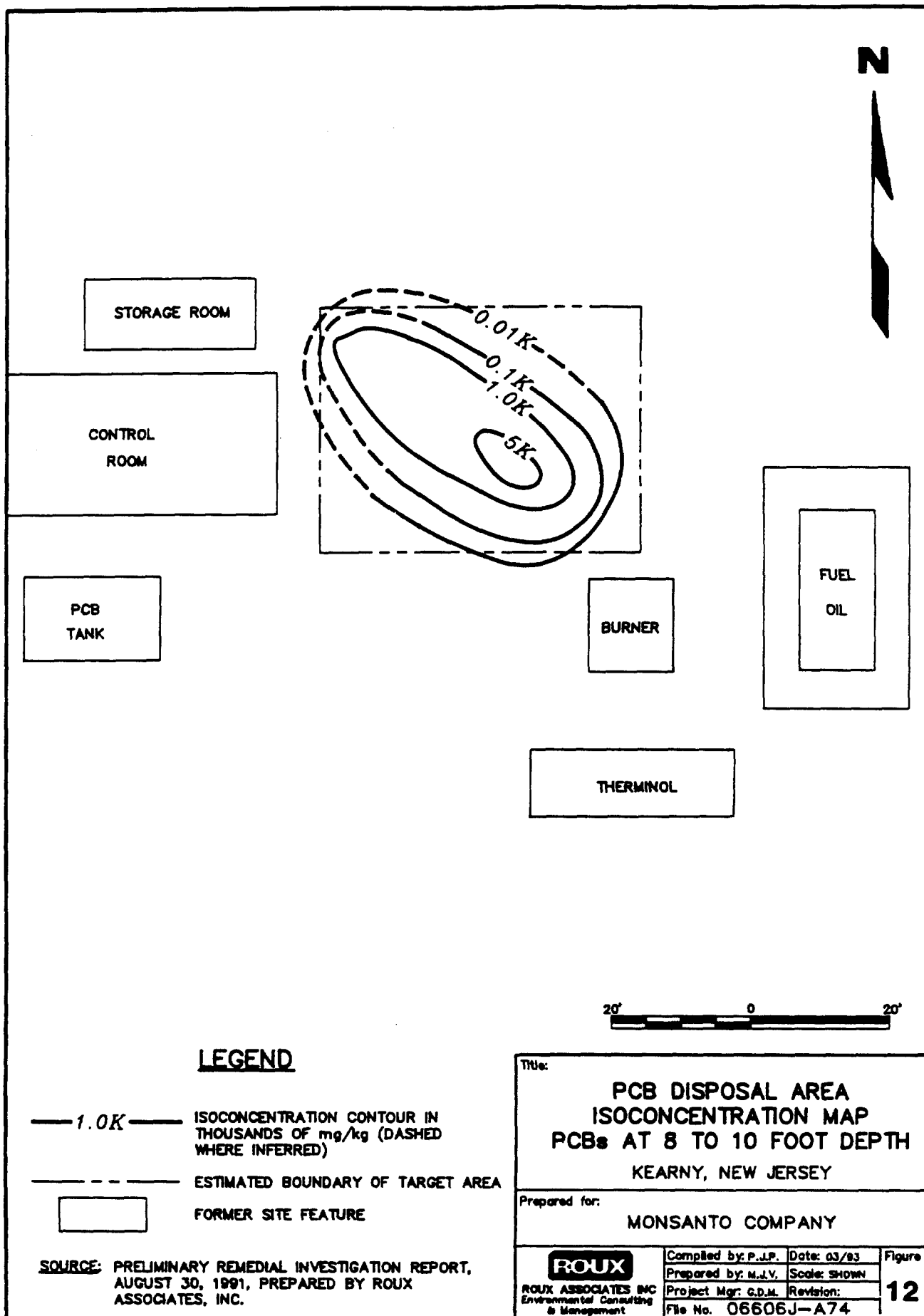
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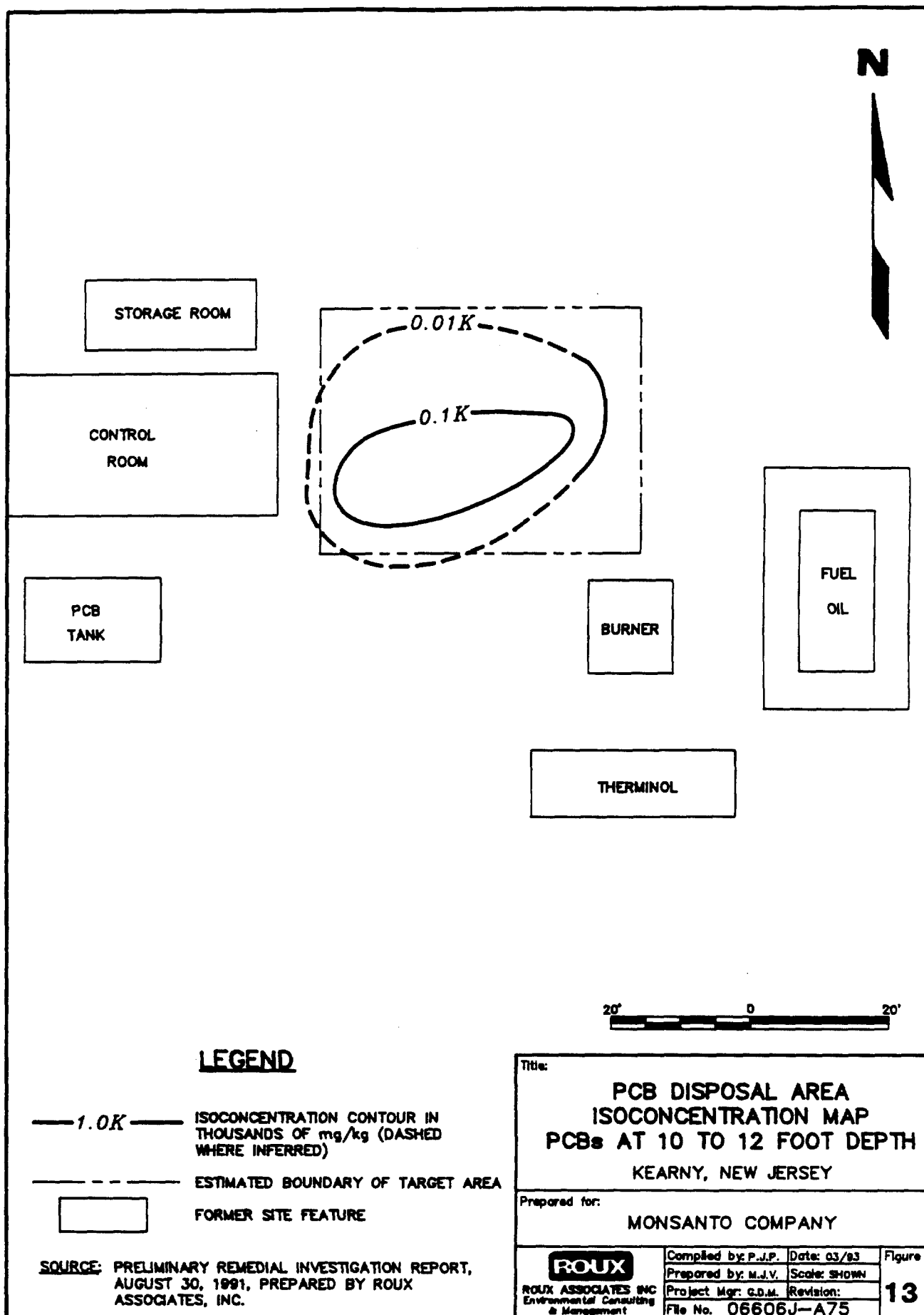


LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|--------------------------------|
| <p>Title:</p> <p>PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 8 TO 10 FOOT DEPTH
KEARNY, NEW JERSEY</p> | | | |
| <p>Prepared for:</p> <p>MONSANTO COMPANY</p> | | | |
| <p>ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management</p> | Compiled by: P.J.P. | Date: 03/93 | <p>Figure</p> <p>12</p> |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A74 | | | |

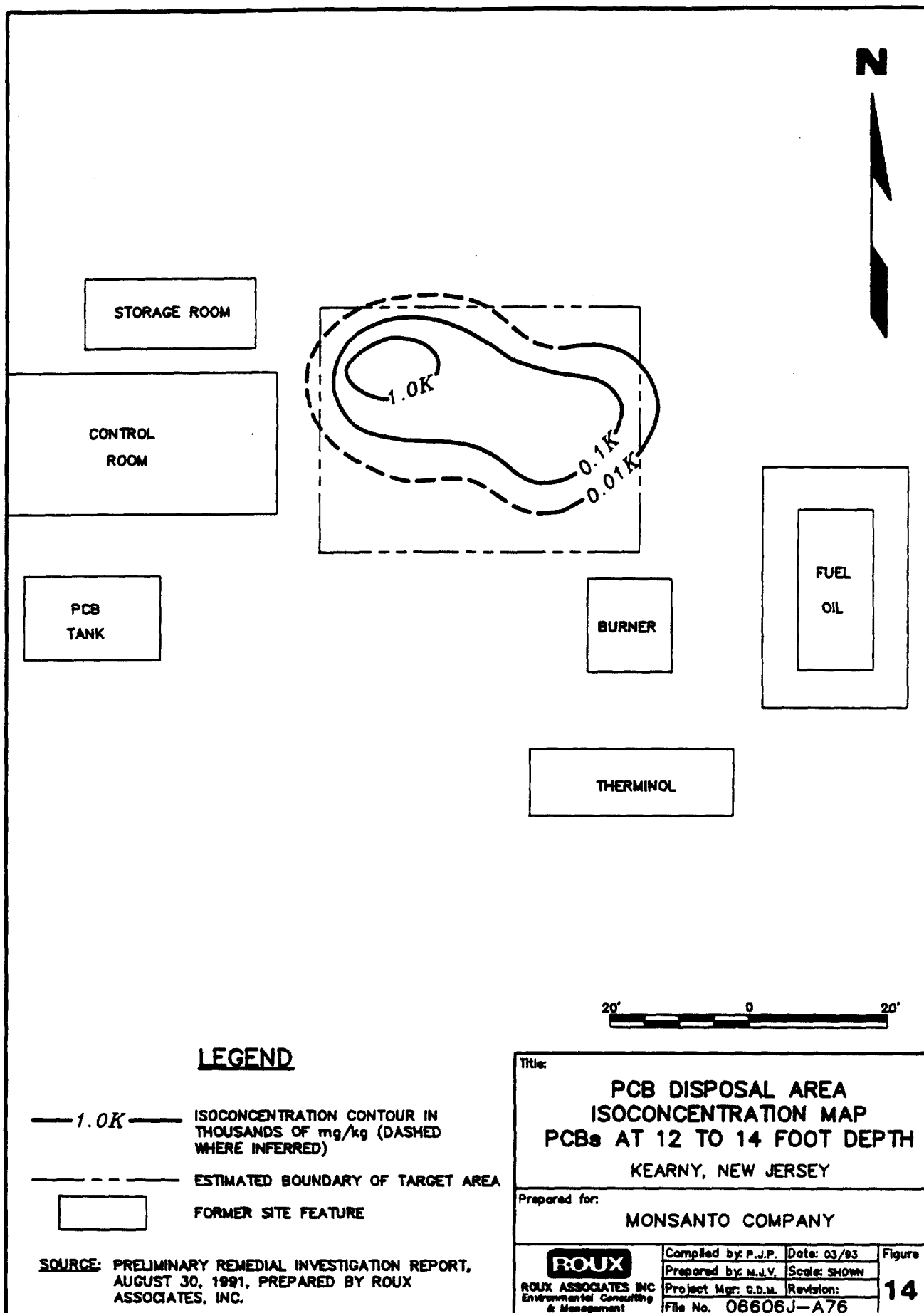


LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|-----------------------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title:
PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 10 TO 12 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 03/93 | Figure
13 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A75 | | | |



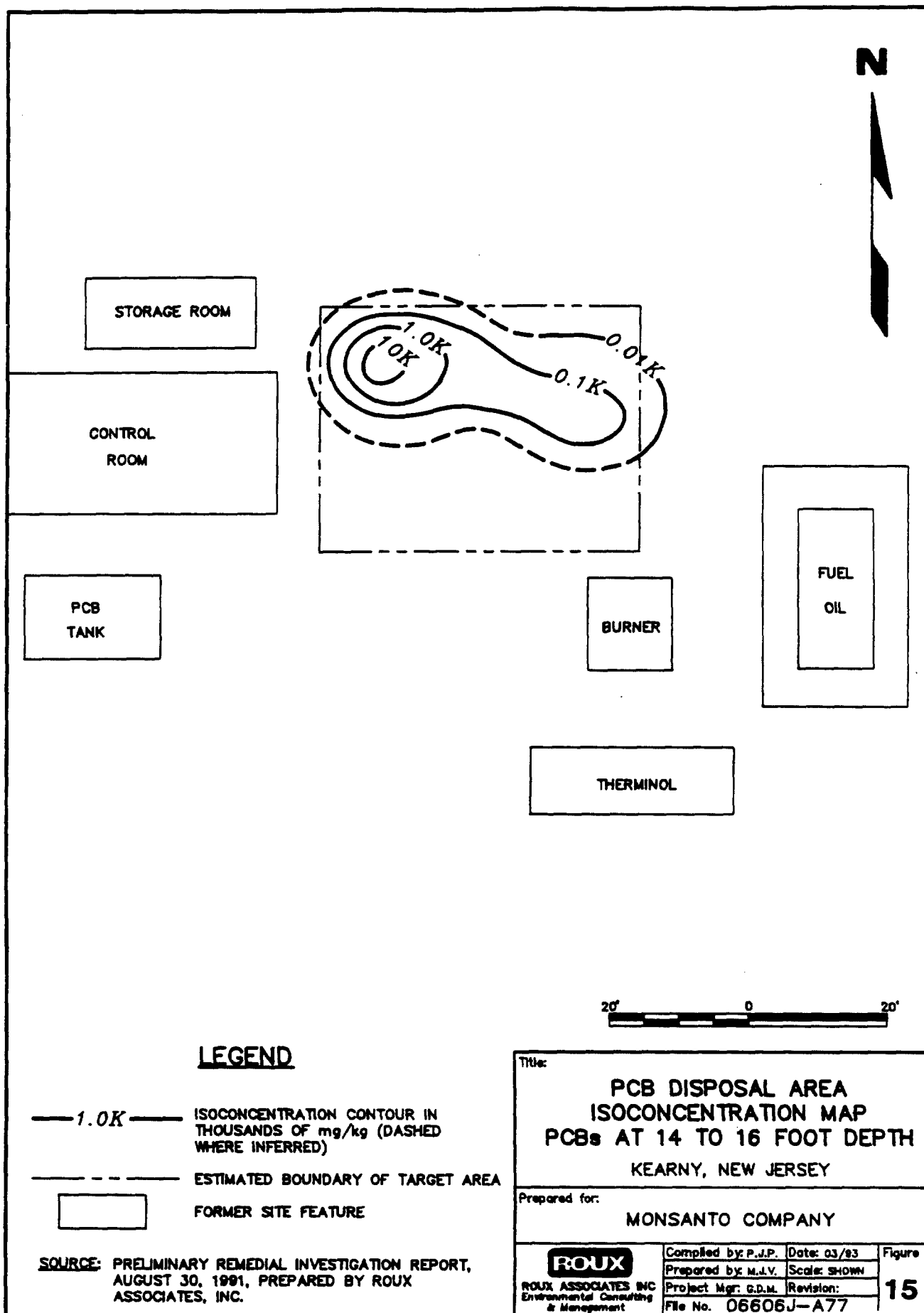
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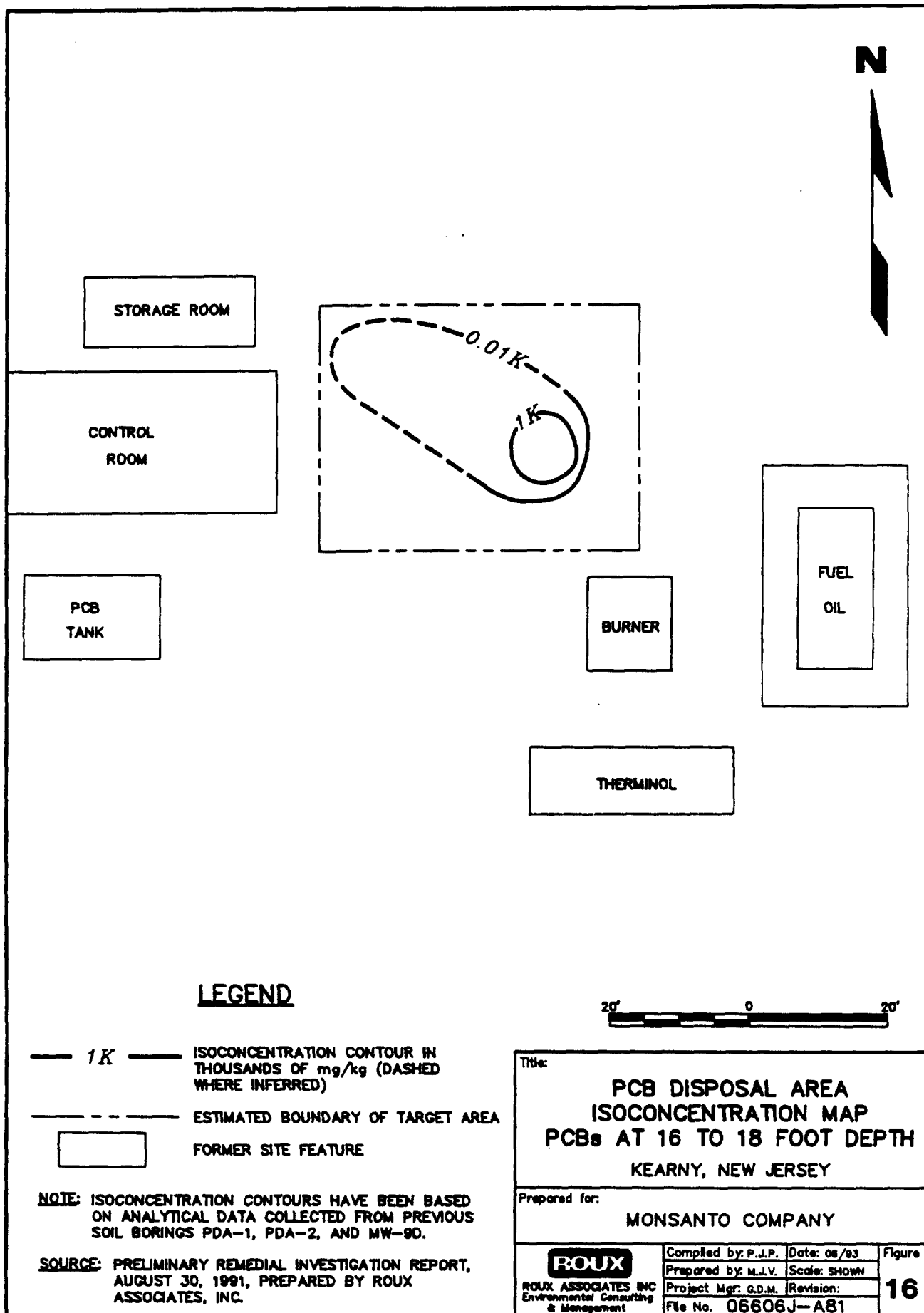
- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
 - - - - - ESTIMATED BOUNDARY OF TARGET AREA
 [] FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

| | | | |
|-----------------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------------|
| Title:
PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 12 TO 14 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 03/93 | Figure
14 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A76 | | | |

850131265





LEGEND

- 1K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-90.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

20' 0 20'

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 16 TO 18 FOOT DEPTH
KEARNY, NEW JERSEY**

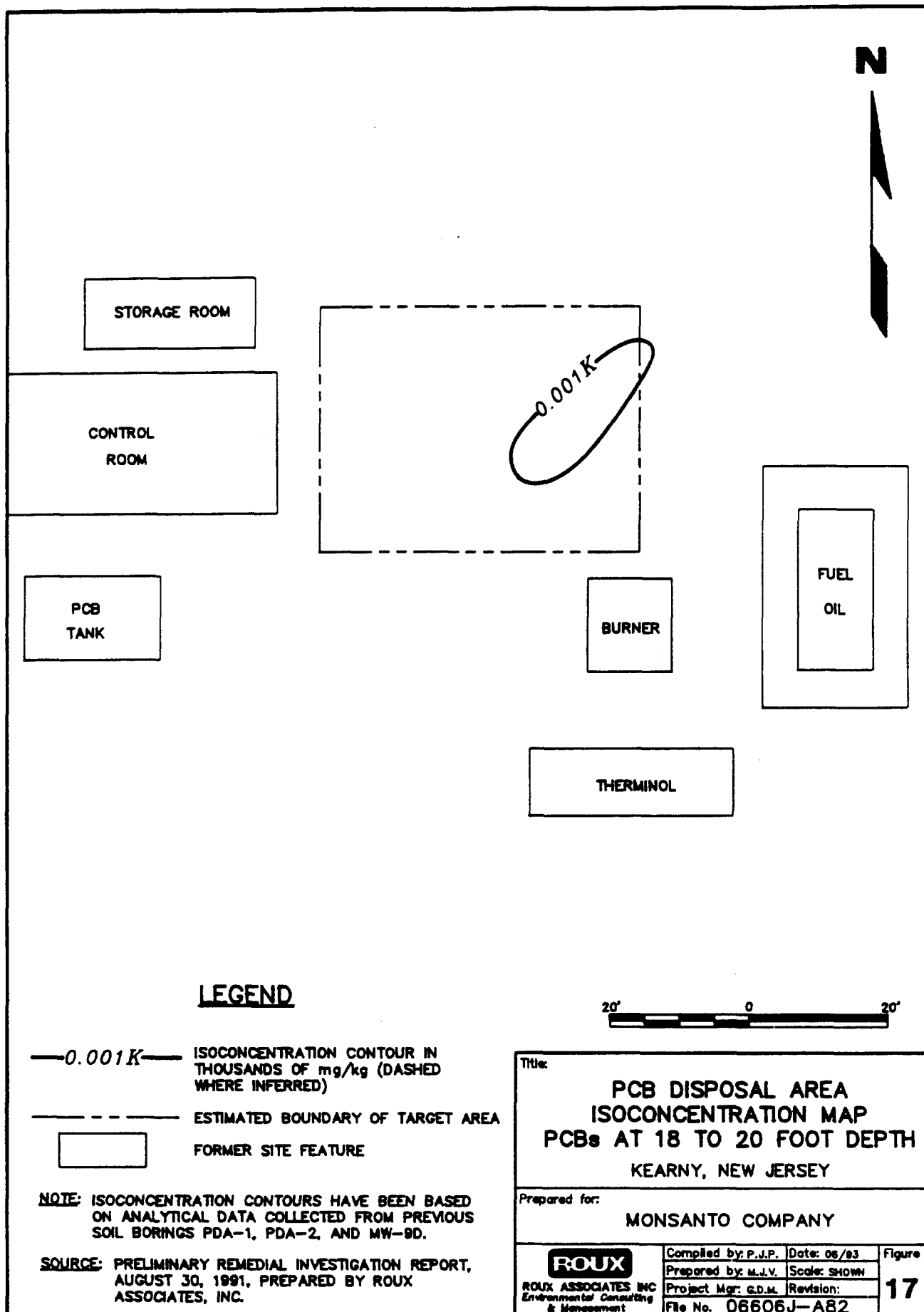
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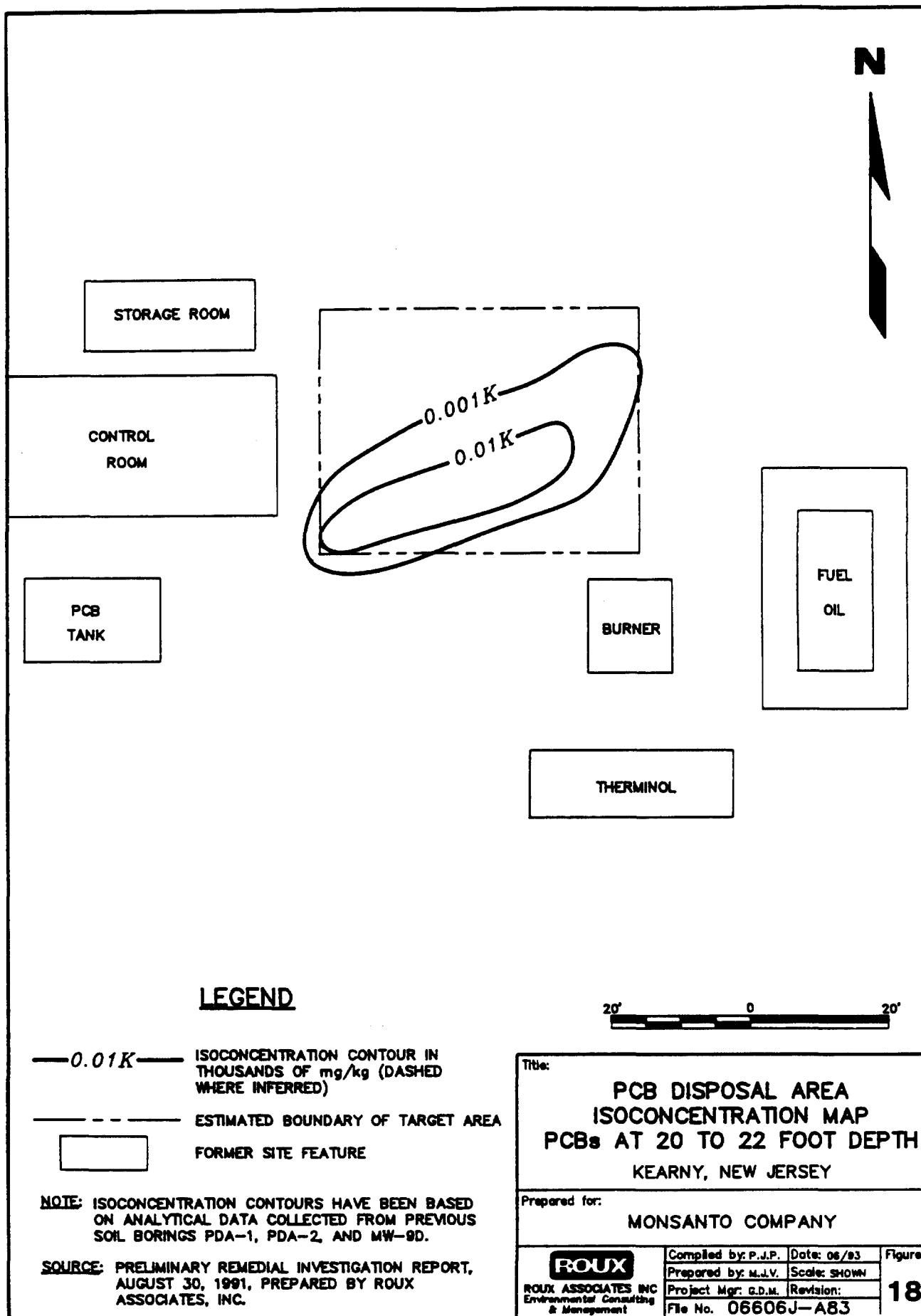
MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | | |
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| Compiled by: P.J.P. | Date: 06/93 | Figure |
| Prepared by: M.J.V. | Scale: SHOWN | 16 |
| Project Mgr: G.D.M. | Revision: | |
| File No. 06606J-A81 | | |

850131267





LEGEND

- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 20 TO 22 FOOT DEPTH
KEARNY, NEW JERSEY**

Prepared for:

MONSANTO COMPANY

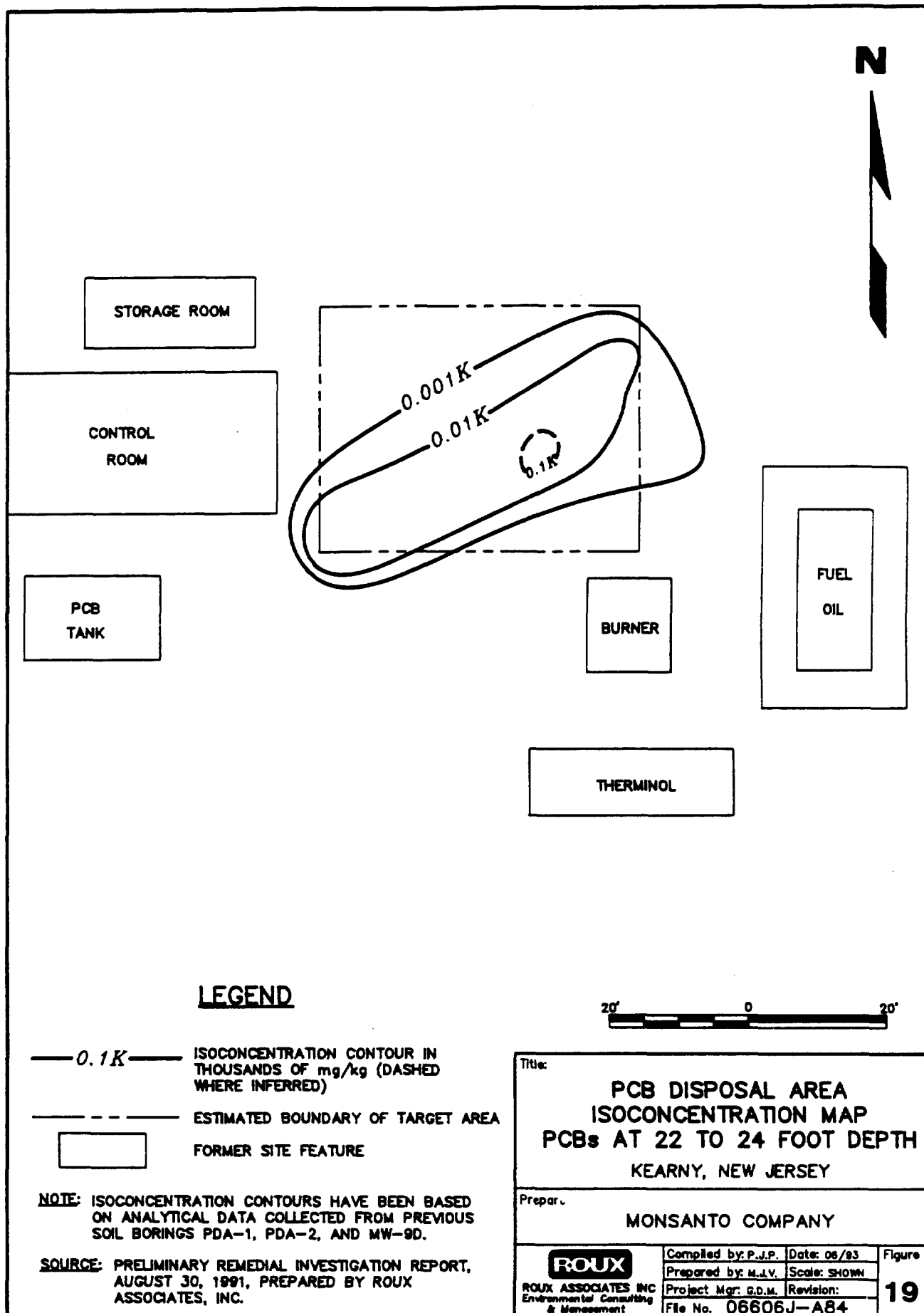
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|--------------|
| Compiled by: P.J.P. | Date: 06/93 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A83 | |

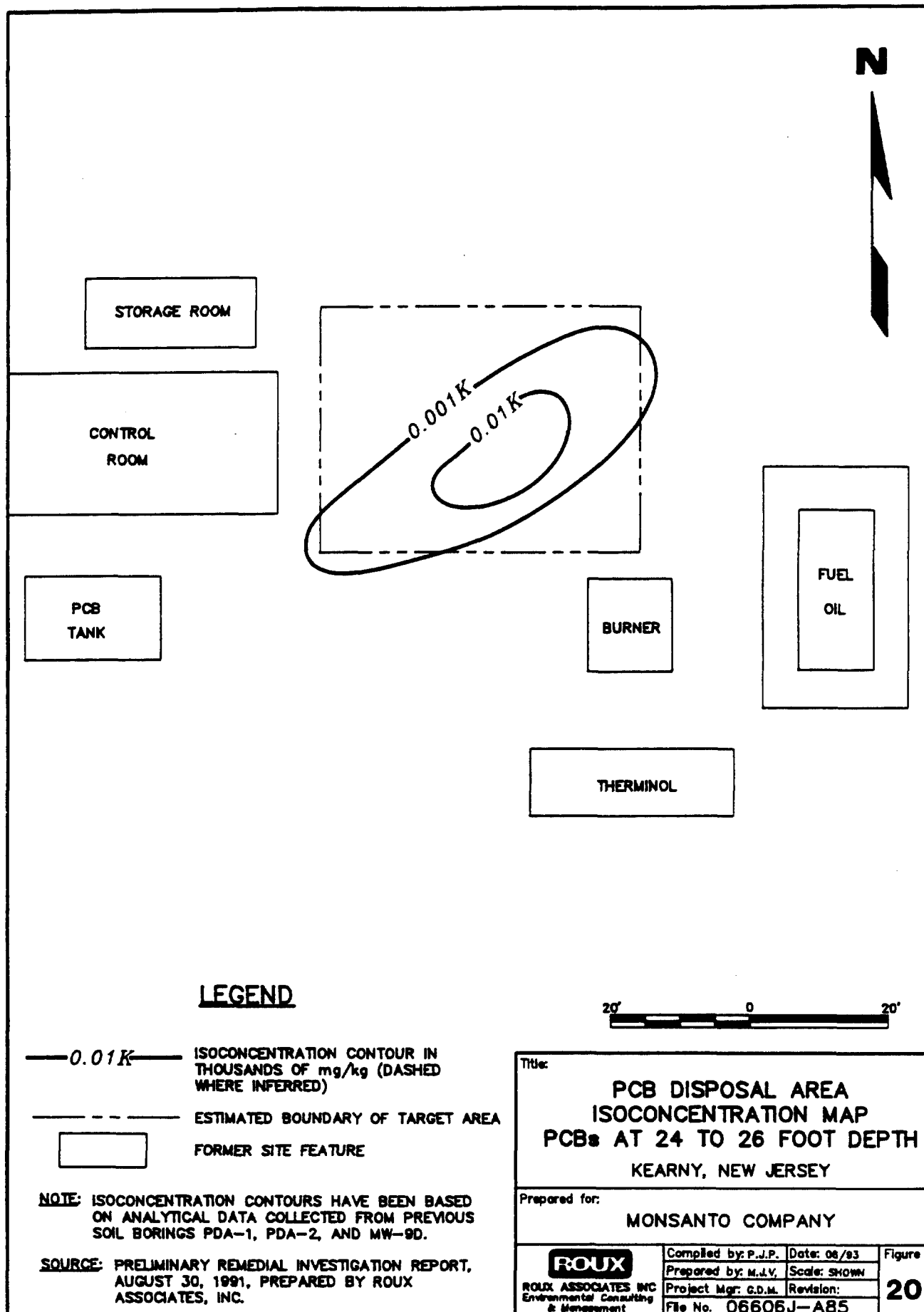
Figure

18

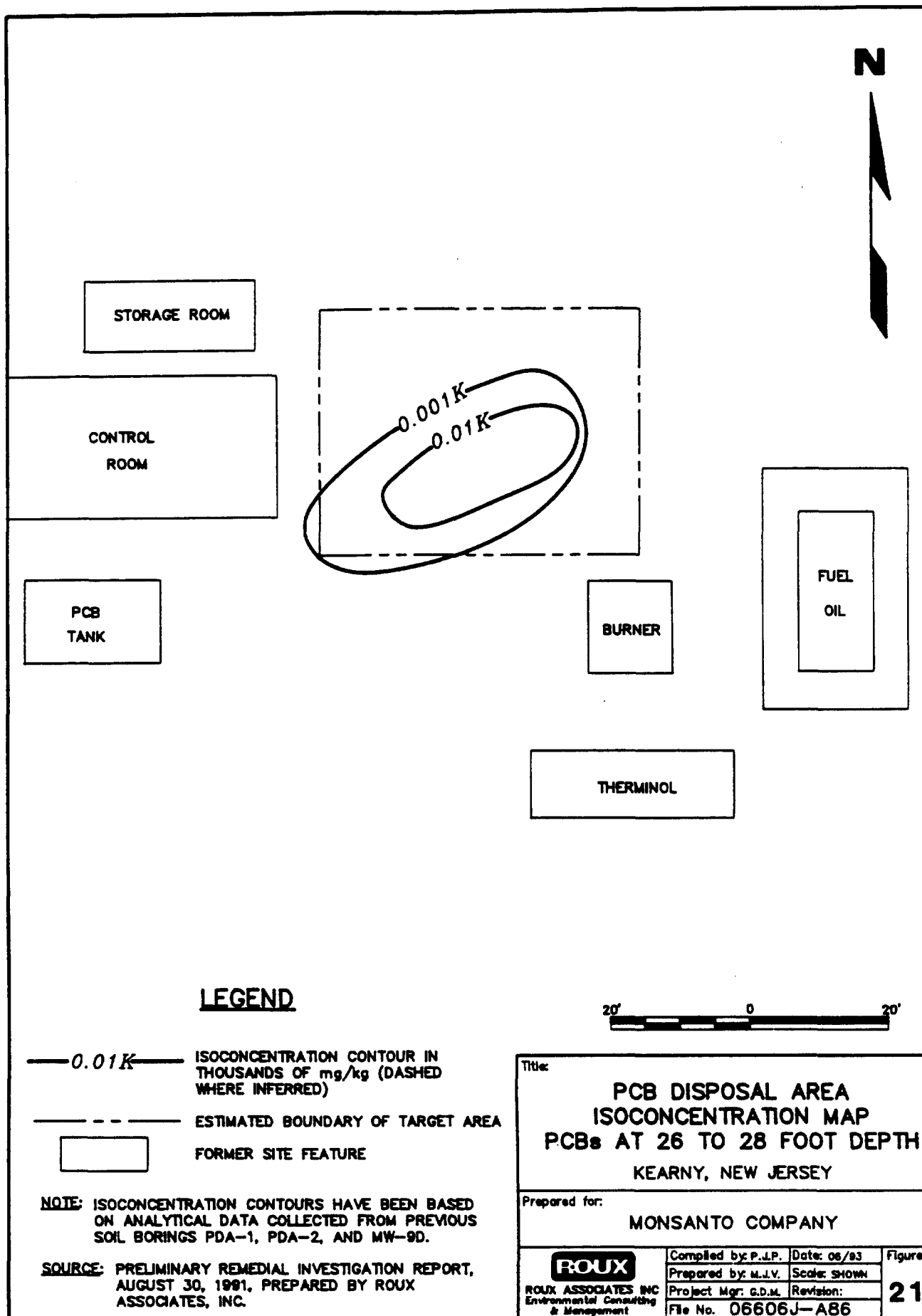
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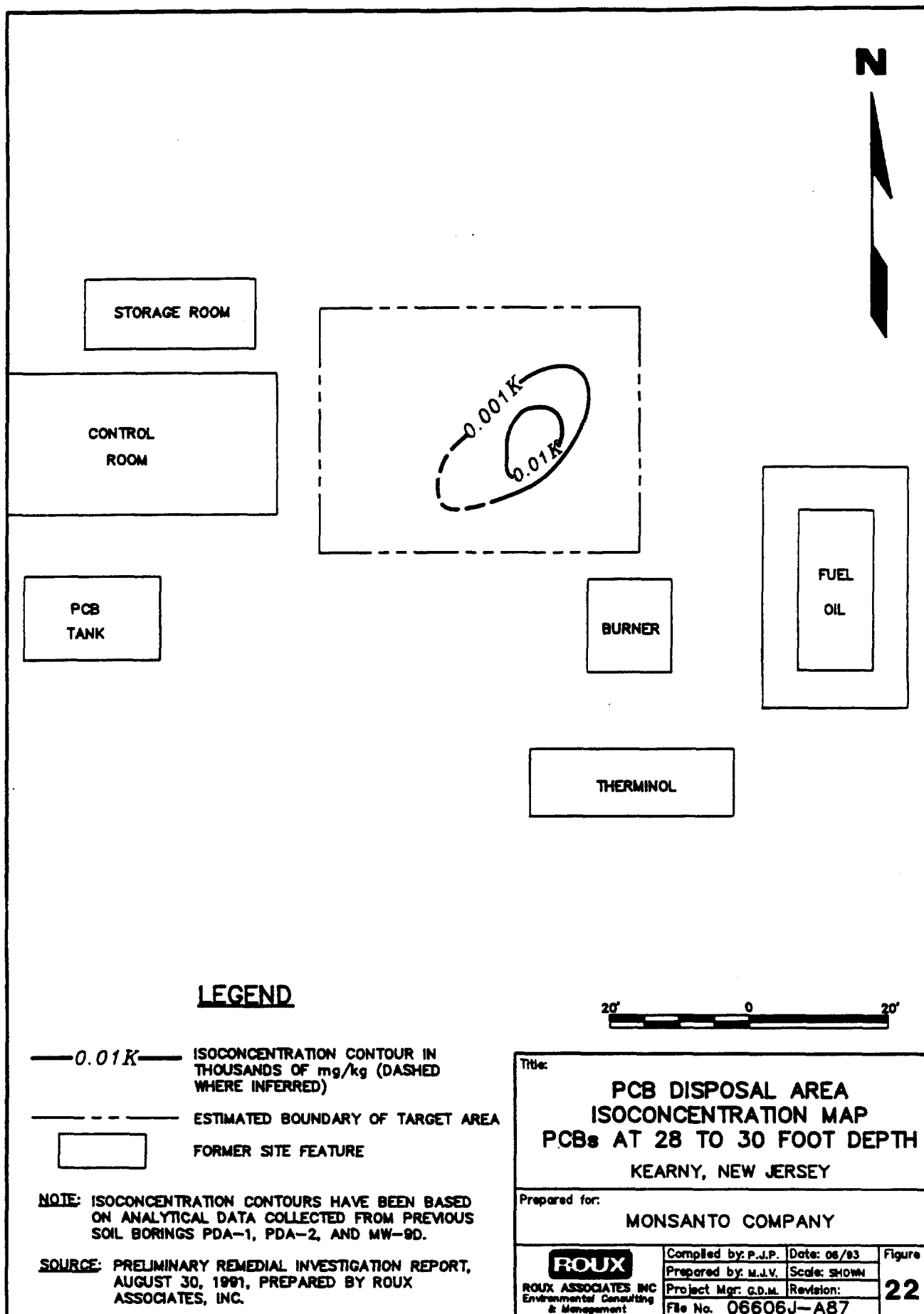
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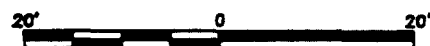
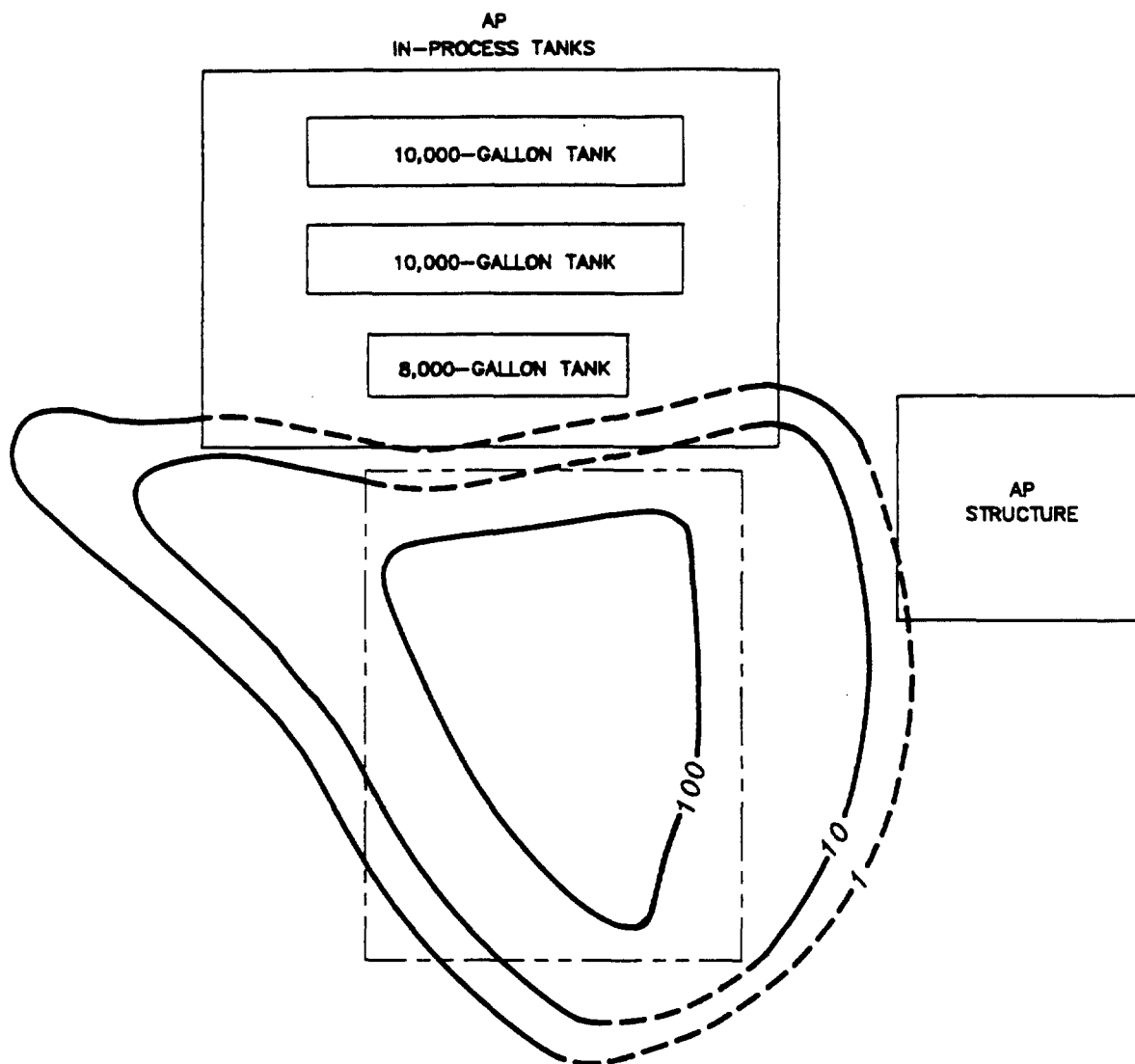
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850131273



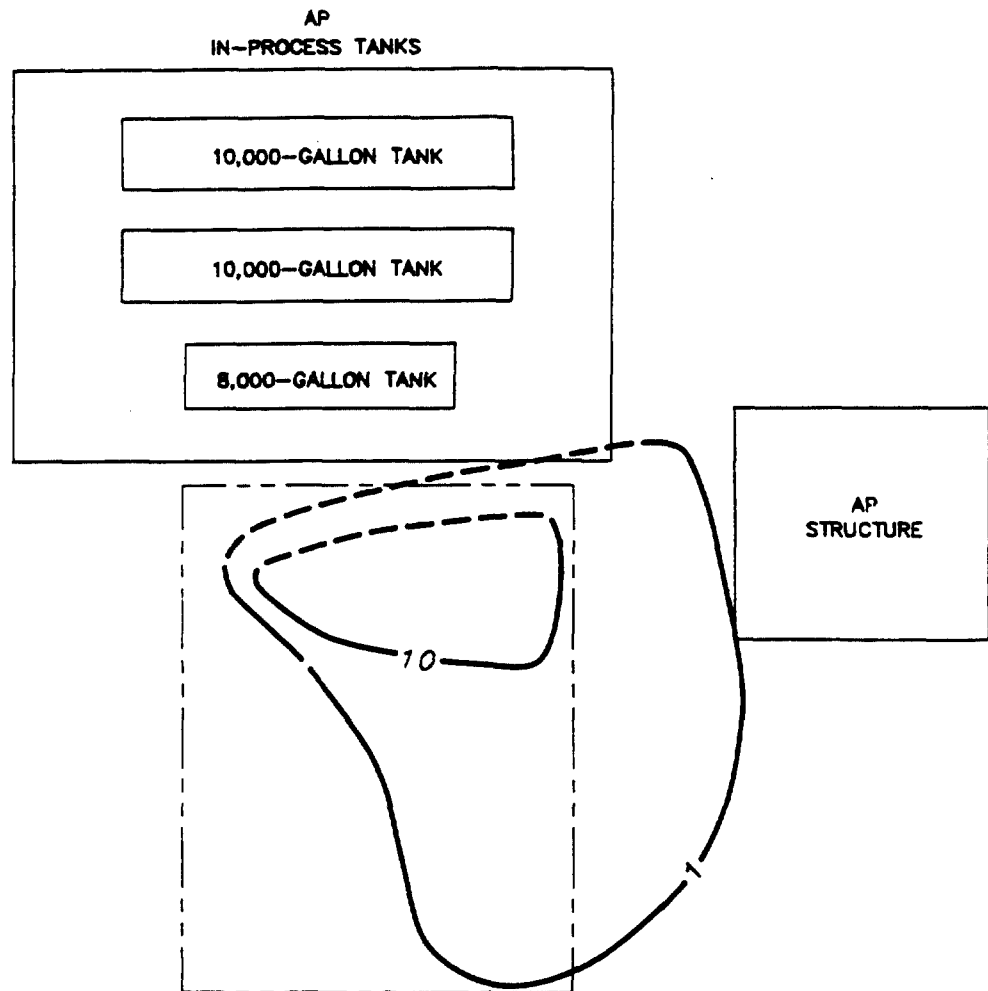
LEGEND

- 100 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

| | | | |
|--------------------------------------------------------------------------------------------|---------------------|--------------|-----------|
| Title: | | | |
| A/P STEROX SUMP
ISOCONCENTRATION MAP
PCBs AT 4 TO 6 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision: | |
| | File No. 06606J-A55 | | |
| | | | 23 |

850131274



LEGEND

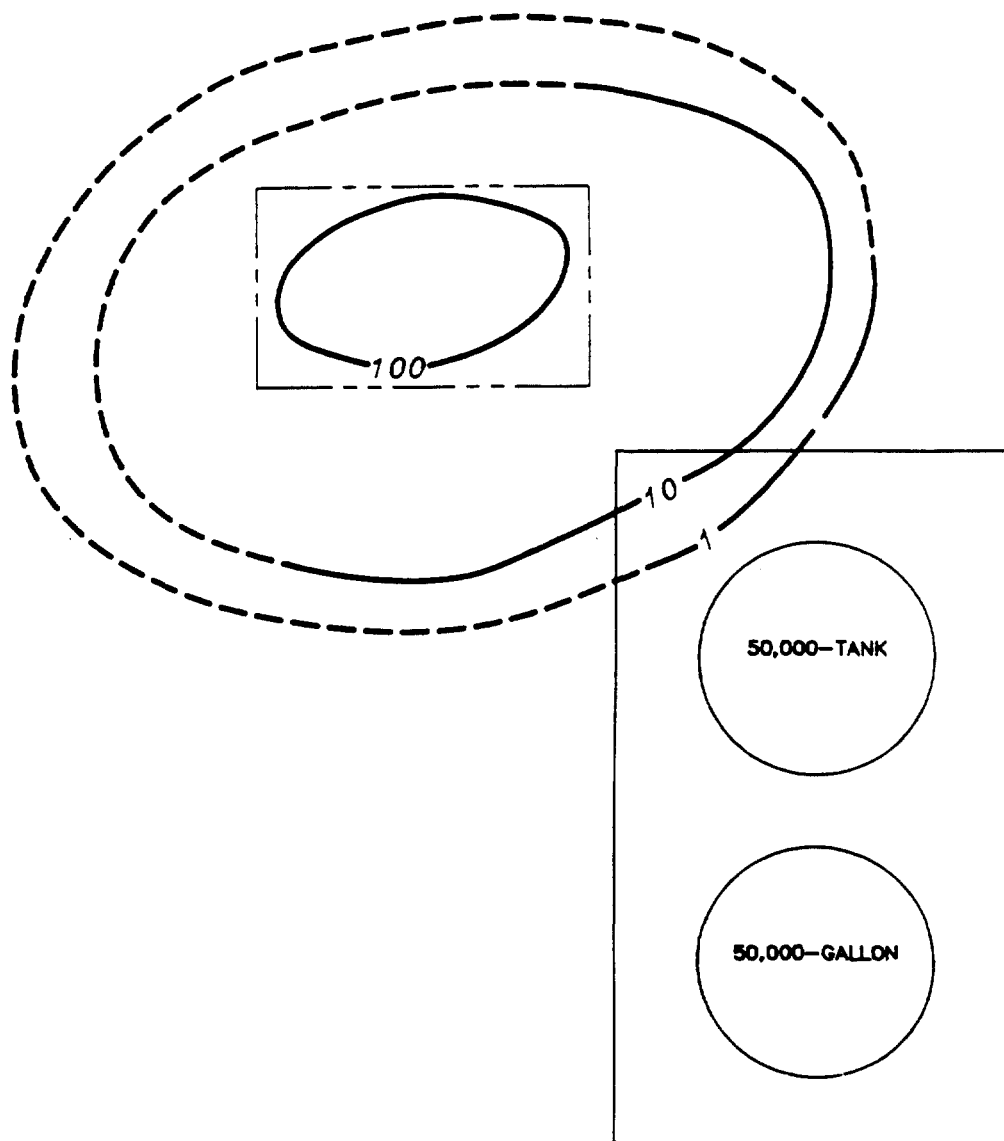
- 10 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

| | | | |
|-------------------------------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: | | | |
| A/P STEROX SUMP
ISOCONCENTRATION MAP
PCBs AT 9 TO 11 FOOT DEPTH
KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
24 |
| | Prepared by: M.J.V. | Scale: shown | |
| | Project Mgr: P.C.S. | Revision: | |
| | File No. 06606J-A56 | | |

850131275

STONE DIKE



LEGEND

- 100 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- — — ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

Title:

SECONDARY SETTLING POND
ISOCONCENTRATION MAP
PCBs AT 4 TO 6 FOOT DEPTH

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Environmental Consulting
& Management

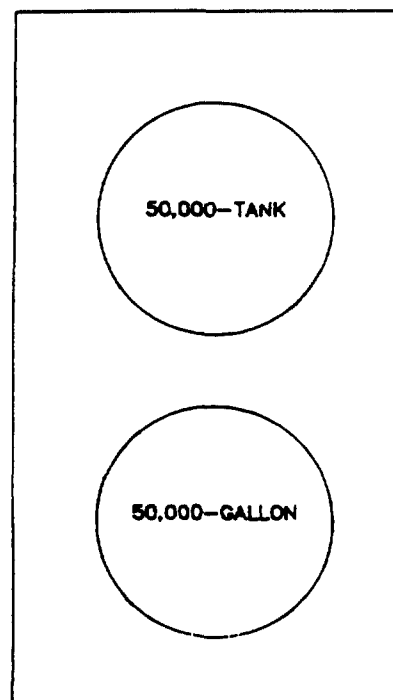
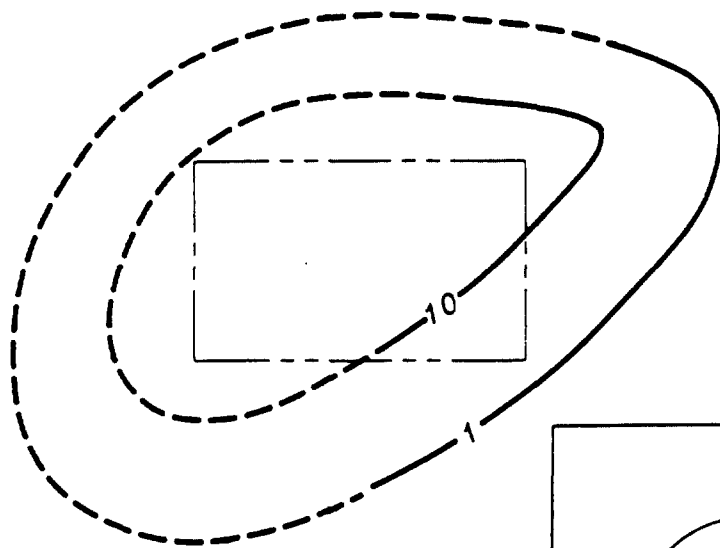
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| Compiled by: P.J.P. | Date: 11/92 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A57 | |

Figure


25

850131276

STONE DIKE



LEGEND

- 10 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
-  FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT,
AUGUST 30, 1991, PREPARED BY ROUX
ASSOCIATES, INC.

Title:

SECONDARY SETTLING POND
ISOCONCENTRATION MAP
PCBs AT 9 TO 11 FOOT DEPTH
KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

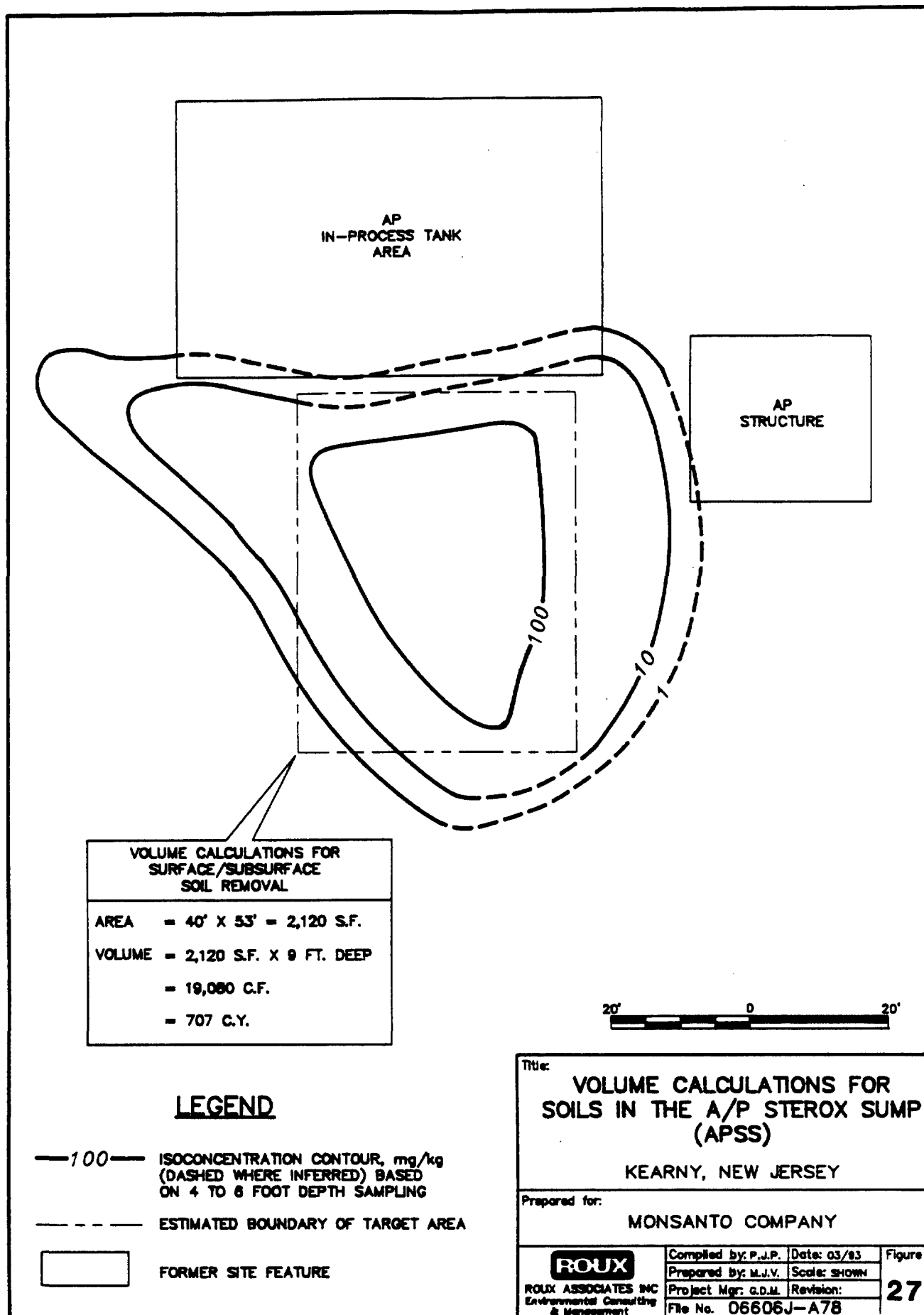
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|--------------|
| Compiled by: P.J.P. | Date: 11/92 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A58 | |

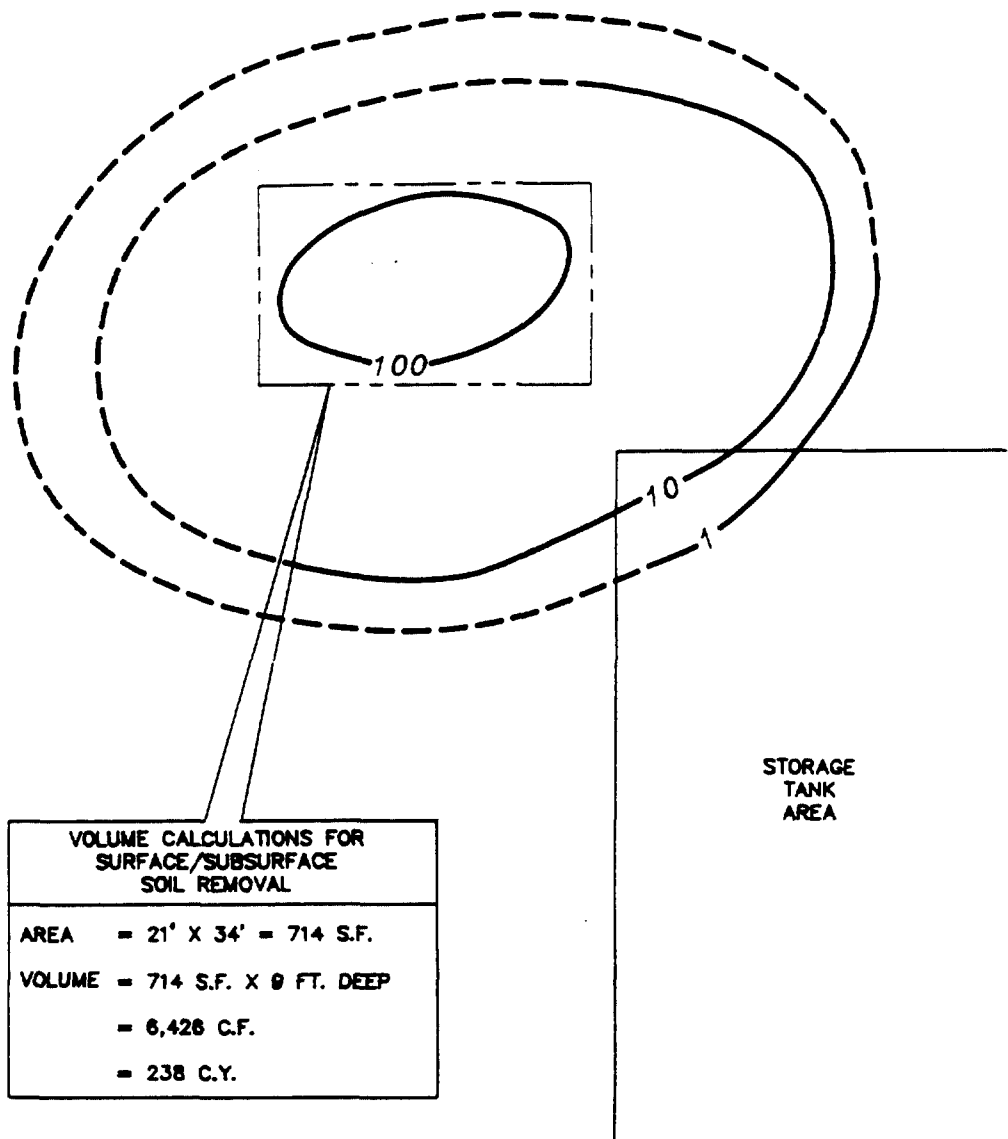
Figure

26

850131277



STONE DIKE



**VOLUME CALCULATIONS FOR
SURFACE/SUBSURFACE
SOIL REMOVAL**

AREA = 21' X 34' = 714 S.F.
VOLUME = 714 S.F. X 9 FT. DEEP
= 6,426 C.F.
= 238 C.Y.



LEGEND

- 100— ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED) BASED ON
4 TO 6 FOOT DEPTH SAMPLING
- - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

Title:
**VOLUME CALCULATIONS FOR
SOILS IN THE SECONDARY
SETTLING POND (SSP)**

KEARNY, NEW JERSEY

Prepared for:

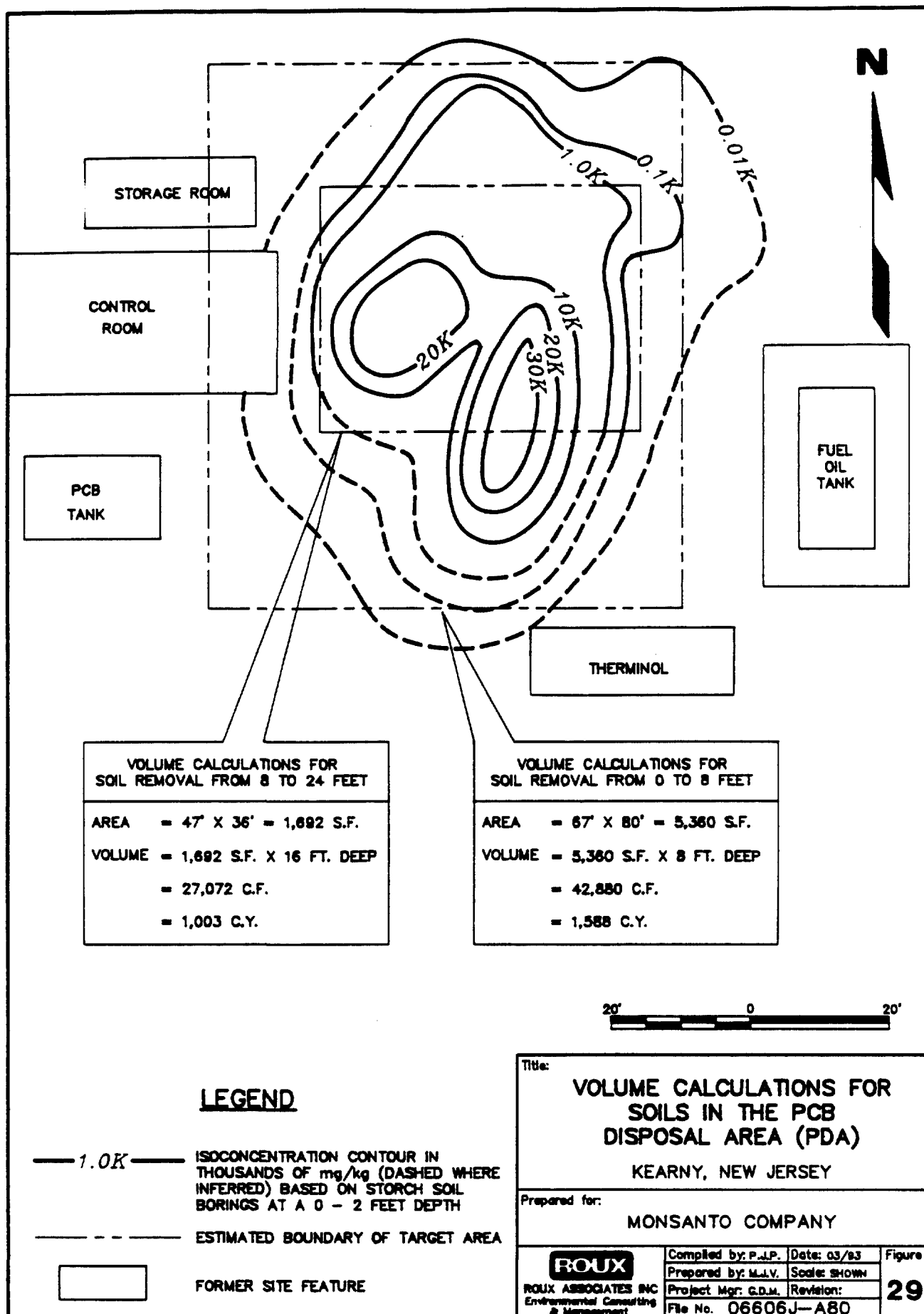
MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

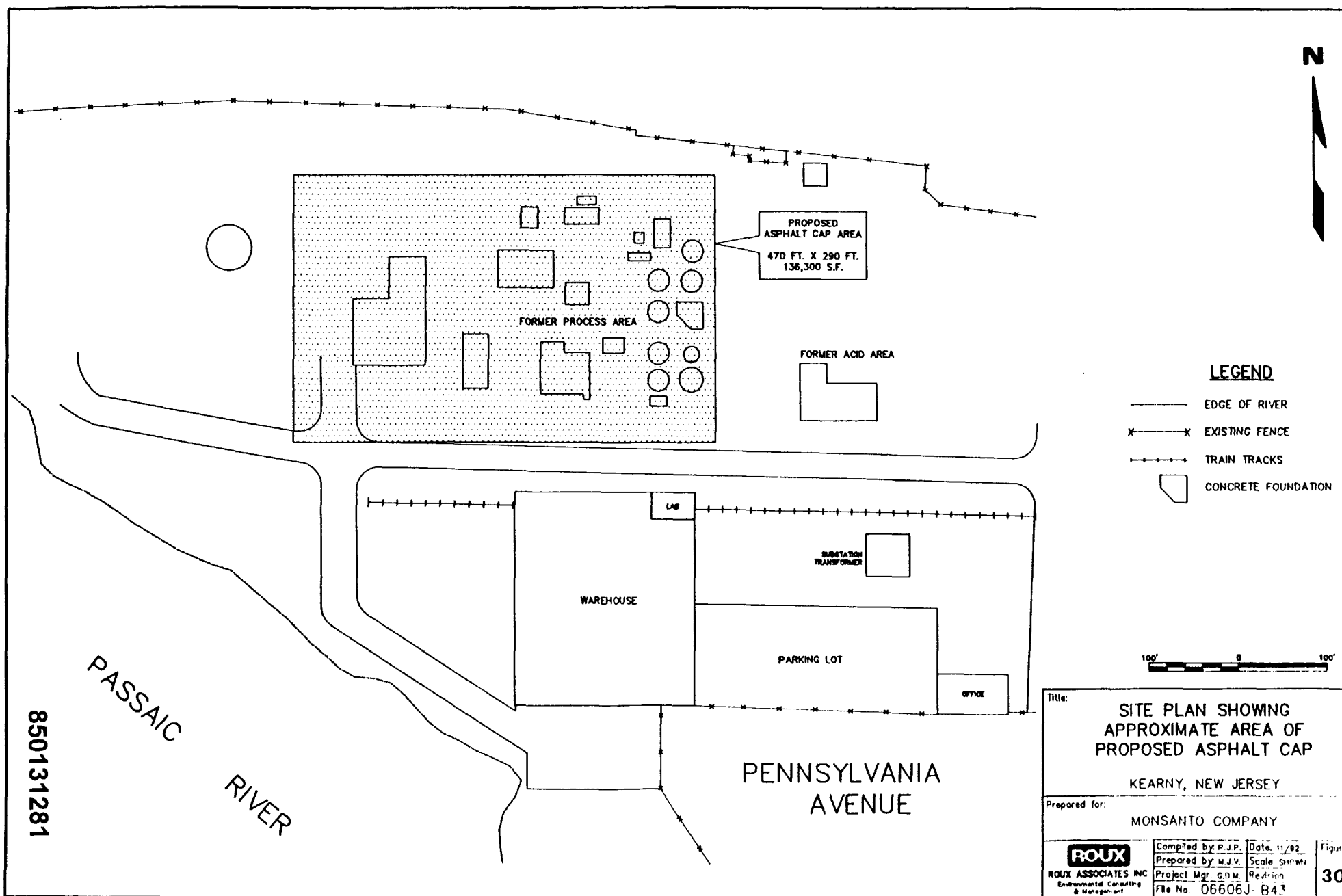
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|---------------------|--------------|
| Compiled by: P.J.P. | Date: 03/93 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: G.D.M. | Revision: |
| File No. 06606J-A79 | |

Figure
28

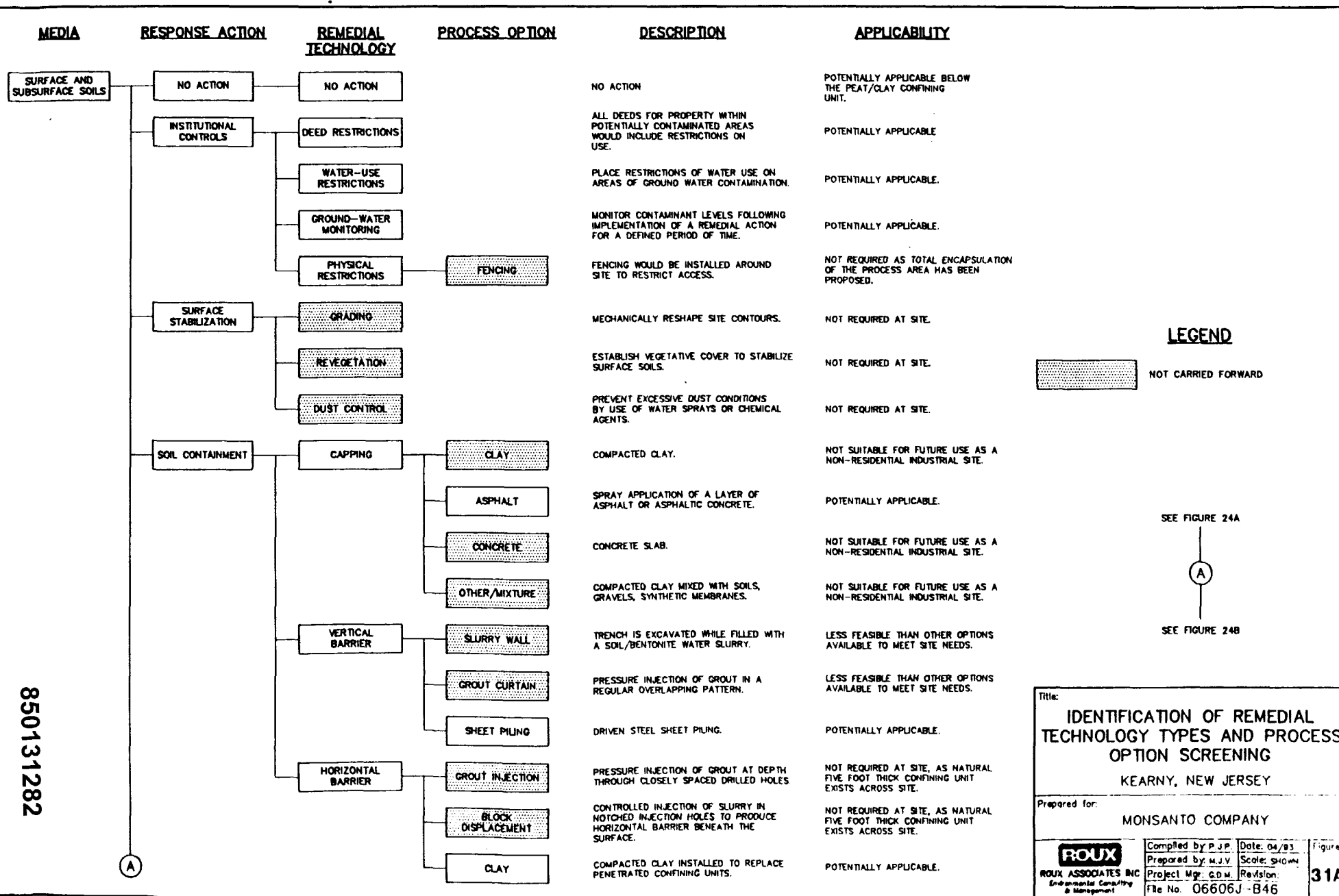
850131279



850131280



850131282



LEGEND



NOT CARRIED FORWARD

SEE FIGURE 24A

A

SEE FIGURE 24B

| | | | |
|--------------------------------------------------------------------------|---------------------|--------------|--------|
| Title: | | | |
| IDENTIFICATION OF REMEDIAL TECHNOLOGY TYPES AND PROCESS OPTION SCREENING | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
|
ROUX ASSOCIATES INC.
Environmental Consulting & Management | Compiled by P.J.P. | Date: 04/93 | Figure |
| | Prepared by M.J.V. | Scale: shown | |
| | Project Mgr: G.D.M. | Revision: | |
| | File No. 06606J-B46 | | |

31A

| MEDIA | RESPONSE ACTION | REMEDIAL TECHNOLOGY | PROCESS OPTION | DESCRIPTION | APPLICABILITY |
|-------|----------------------|----------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| A | REMOVAL AND DISPOSAL | EXCAVATE AREAS OF CONCERN AND LANDFILL | OFF-SITE TSCA LANDFILL | PERMANENT STORAGE OF CONTAMINATED SOILS AT AN APPROVED TSCA PERMITTED FACILITY. | POTENTIALLY APPLICABLE |
| | ON-SITE TREATMENT | BIOLOGICAL | COMPOSTING | MATERIALS PLACED IN CONTROLLED ENVIRONMENT WITH ADDITION OF HEAT AND AIR TO AID MICROBIAL DEGRADATION OF ORGANICS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | | DECHLORINATION | SODIUM REAGENT USED TO STRIP CHLORINE ATOMS FROM POLYCHLORINATED BIPHENYLS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | CHEMICAL | OXIDATION | OXIDIZER SUCH AS OZONE, HYDROGEN PEROXIDE, OR PERMANGANATE IS INTRODUCED INTO A CONTACTOR WHERE IT MIXES WITH SOIL AND OXIDATION OCCURS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | | SOLVENT EXTRACTION | SOLVENT IS INTRODUCED INTO CONTACTOR WHERE IT MIXES WITH SOLIDS AND EXTRACT IS COLLECTED AND LATER TREATED. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | PHYSICAL | SOIL WASHING | USE OF WATER OR STEAM TO WASH OR VOLATILIZE AND FLUSH CONTAMINANTS FROM SOIL OR GRAVEL. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | | SOLIDIFICATION/FIXATION | SOLIDIFICATION OR STABILIZATION OF CONTAMINATED SOILS USING SULFIDE, LIME, CEMENT, MOLTEN GLASS, OR VARIOUS PROPRIETARY OR PATENTED PRODUCTS. | NOT RETAINED AS AN EX-SITU PROCESS. SEE IN-SITU DESCRIPTION BELOW. |
| | | | DESORPTION | PHYSICAL SEPARATION OF PCB'S USING INDIRECT OR DIRECT HEAT EXCHANGE TO VAPORIZE ORGANIC CONTAMINANTS FROM SOILS. | POTENTIALLY APPLICABLE. |
| | | THERMAL | DESORPTION | PHYSICAL SEPARATION OF PCB'S USING INDIRECT OR DIRECT HEAT EXCHANGE TO VAPORIZE ORGANIC CONTAMINANTS FROM SOILS. | POTENTIALLY APPLICABLE. |
| | OFF-SITE TREATMENT | BIOLOGICAL | LICENSED LANDFARM | SOILS SPREAD OVER LAND IN LICENSED LANDFARM. BIOLOGICAL DEGRADATION WITH MICRO-ORGANISMS IN AERATED AND NUTRIENT-RICH SOILS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | THERMAL | TSCA INCINERATOR | THERMAL DESTRUCTION OF CONTAMINATED SOILS AND LIQUIDS IN APPROVED TSCA PERMITTED INCINERATOR. | POTENTIALLY APPLICABLE. |
| | IN-SITU TREATMENT | BIOLOGICAL | BIODEGRADATION | SOILS SEEDED WITH MICRO-ORGANISMS AND NUTRIENTS TO STIMULATE BIOLOGICAL DEGRADATION. | PROMISING TECHNOLOGY BUT NOT PROVEN EFFECTIVE ON CONTAMINANTS PRESENT. |
| | | | OXIDATION | IN-SITU INJECTION OF CHEMICALS SUCH AS OZONE, HYDROGEN PEROXIDE, OR PERMANGANATE FOR DEGRADATION OF ORGANICS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | CHEMICAL | REDUCTION | IN-SITU APPLICATION OF CHEMICALS WHICH REDUCE THE OXIDATION STATE OF COMPOUNDS. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | | VITRIFICATION | CONTAMINATED MATERIAL IS FUSED INTO GLASSY STABLE MATERIALS BY HEATING IT IN PLACE USING AN ELECTRICAL CURRENT. | IMPRACTICAL DUE TO SHALLOW GROUND WATER TABLE. |
| | | PHYSICAL | SOIL FLUSHING | APPLICATION OF WATER EITHER VIA SURFACE FLOODING OR INJECTION AND COLLECTION OF EXTRACT AT WELLS FOLLOWED BY TREATMENT. | NOT PROVEN EFFECTIVE ON PCB CONTAMINANTS PRESENT. |
| | | | SOLIDIFICATION/FIXATION | SOLIDIFICATION AND STABILIZATION OF CONTAMINANTS USING DRILLING METHODS MIXED WITH INJECTION OF CEMENT/BENTONITE SLURRY. | POTENTIALLY APPLICABLE. |

LEGEND

NOT CARRIED FORWARD

SEE FIGURE 24A

A

SEE FIGURE 24B

Title:

IDENTIFICATION OF REMEDIAL TECHNOLOGY TYPES AND PROCESS OPTION SCREENING

KEARNY, NEW JERSEY

Prepared for:

MONSANTO COMPANY

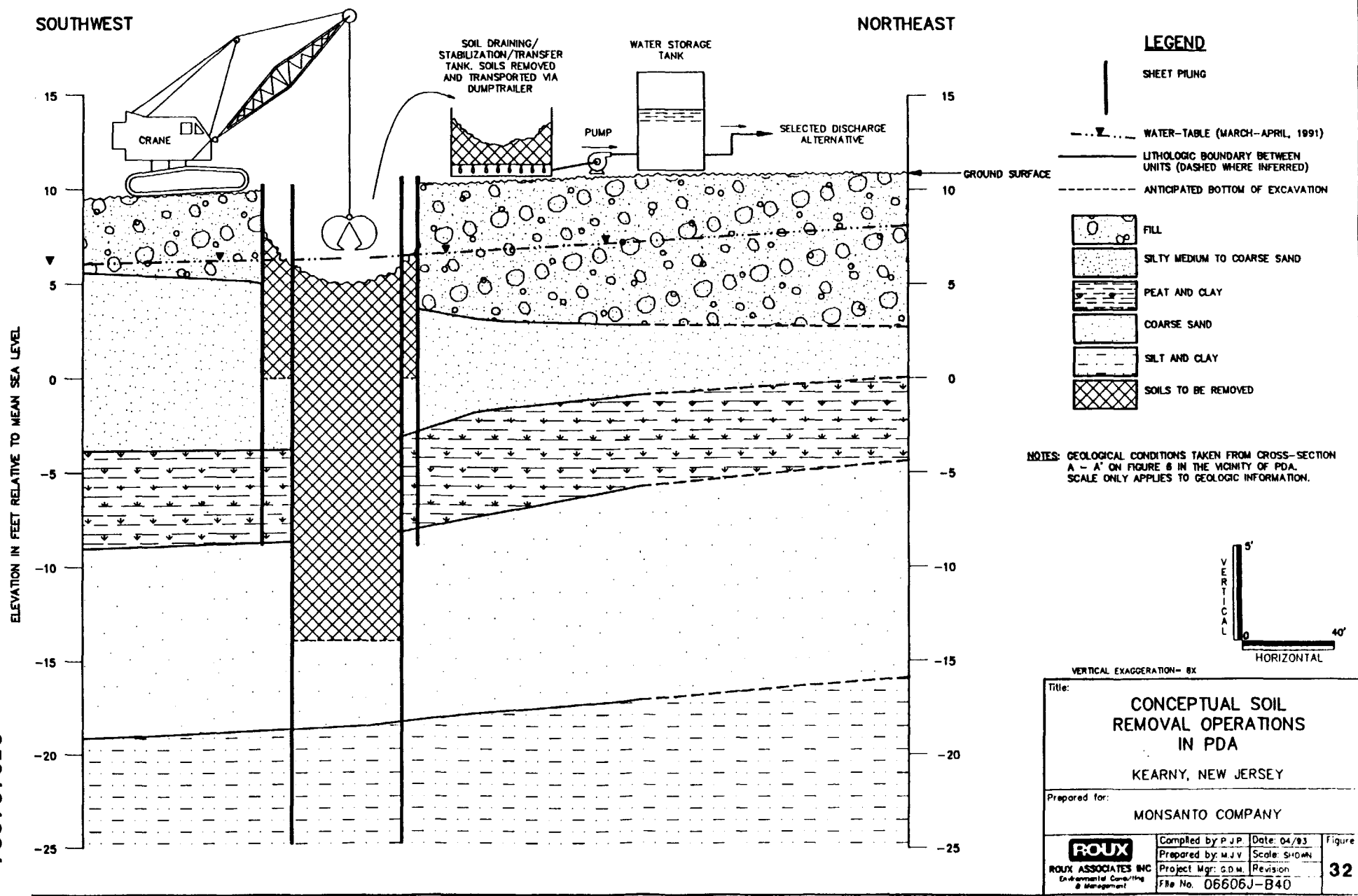
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

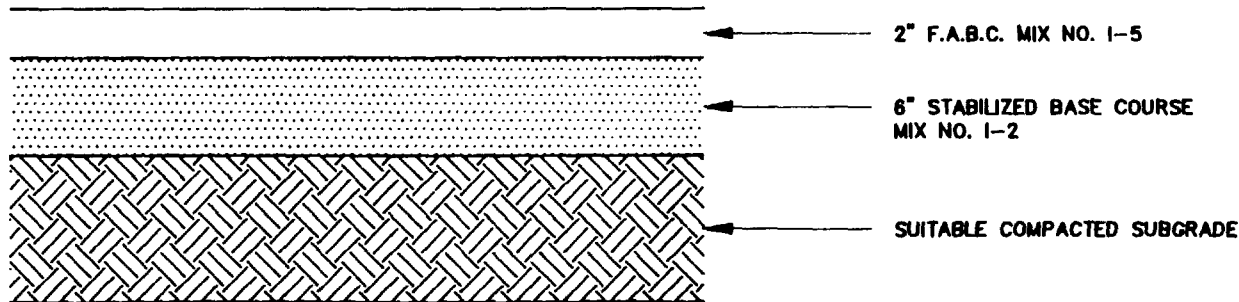
Complied by P.J.P. Date: 11/82
Prepared by M.J.V. Scale: shown
Project Mgr: G.D.M. Revision:
File No. 06806J-B47

Figure

31B

850131284



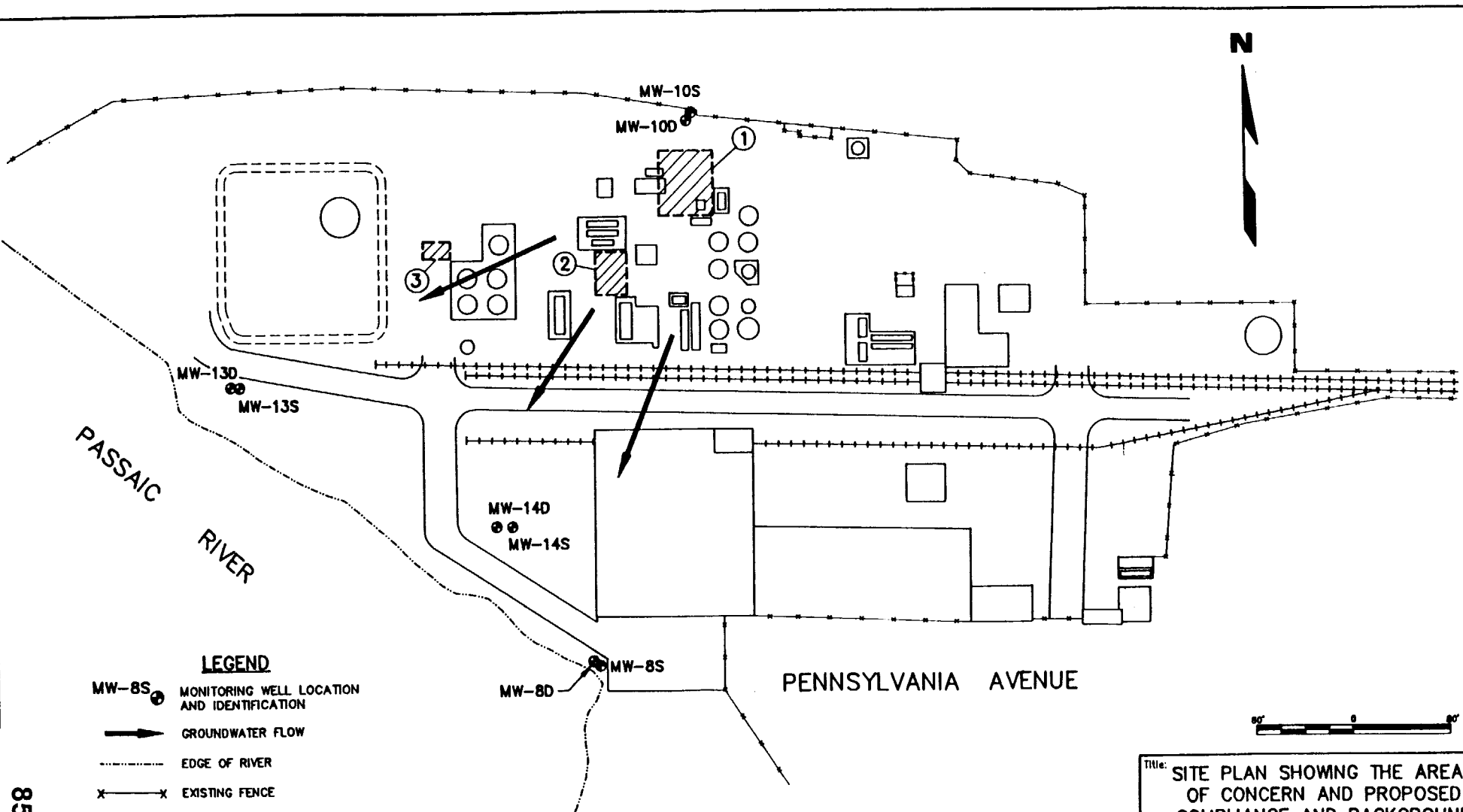


MATERIALS

1. GENERAL: MATERIALS AND MIXTURES SHALL COMPLY WITH SECTION 304 AND SECTION 404 OF THE NEW JERSEY STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS.
2. FABC SURFACE COURSE AND LEVEL COURSE:
A. MIXTURE: MIX NO. 1-5, TABLE 903-1
3. BITUMINOUS STABILIZED BASE MATERIAL:
A. MIXTURE: MIX NO. 1-2, STONE MIX, TABLE 903-1
4. JOB MIX FORMULA WILL BE PROVIDED FOR EACH REQUIRED BITUMINOUS AGGREGATE MIXTURE AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

| | | | |
|----------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| Title: VERTICAL CROSS-SECTION
SHOWING PROPOSED
ASPHALT CAP DETAIL | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for:
MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure
33 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: C.D.M. | Revision: | |
| | File No. 06606J-A53 | | |

850131285



LEGEND

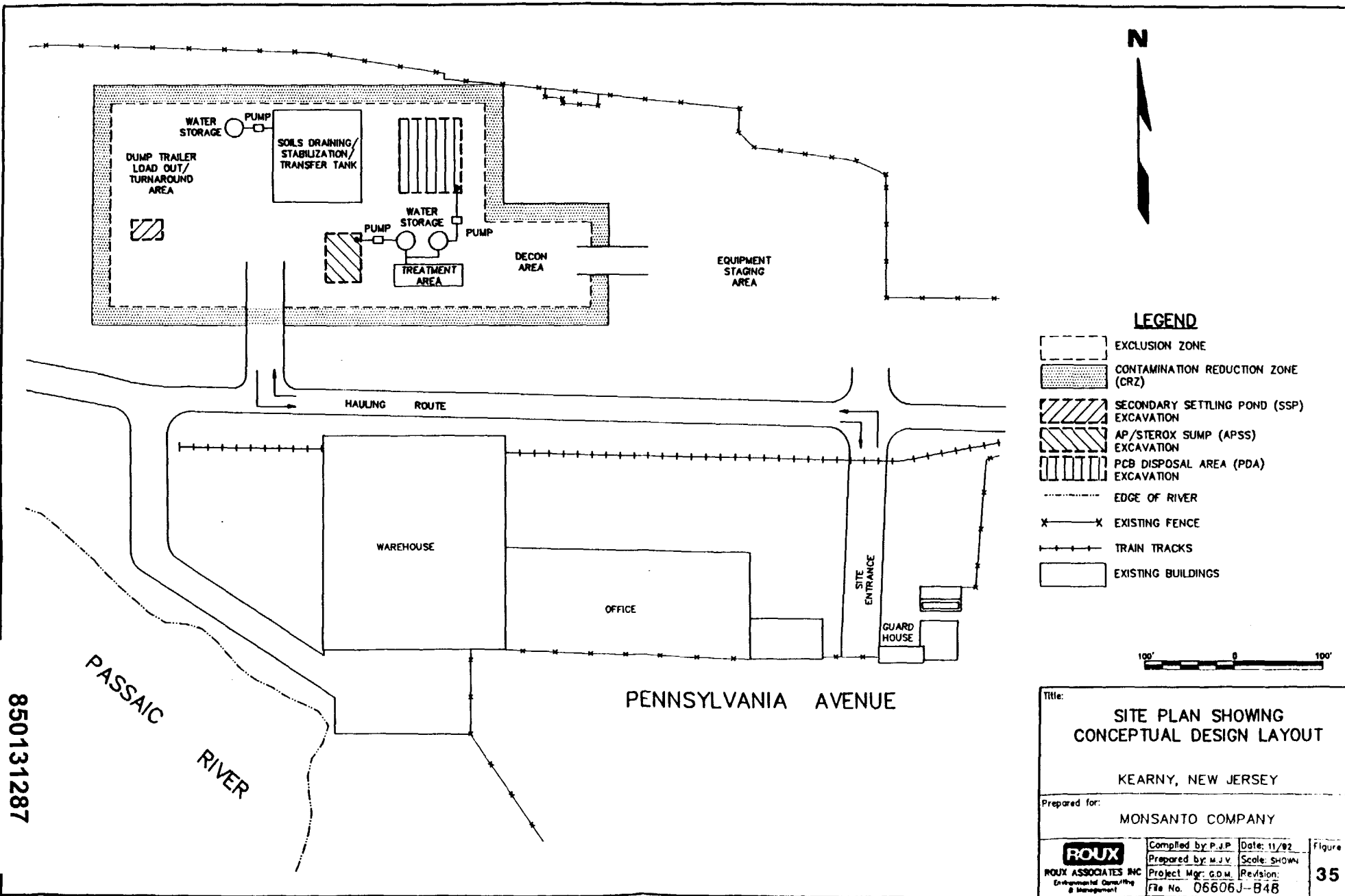
- MW-8S ● MONITORING WELL LOCATION AND IDENTIFICATION
- GROUNDWATER FLOW
- - - - - EDGE OF RIVER
- x x x EXISTING FENCE
- + + + + + TRAIN TRACKS
- ▨ APPROXIMATE LOCATION OF AREA OF CONCERN
- ① PCB DISPOSAL AREA (PDA)
- ② AP/STEROX SUMP (APSS)
- ③ SECONDARY SETTLING POND (SSP)

Title: SITE PLAN SHOWING THE AREAS OF CONCERN AND PROPOSED COMPLIANCE AND BACKGROUND WELL LOCATIONS
KEARNY, NEW JERSEY

Prepared for: MONSANTO COMPANY

| | | | |
|--------------------------------------------------------------------------------|---------------------|--------------|---------------------|
| ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 06/93 | Figure
34 |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: G.D.M. | Revision | |
| | File No: 06606J-B53 | | |

850131286



850131287

850131288

| TASK DESCRIPTION | ESTIMATED TIME TO COMPLETE TASK (WEEKS) | | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1. INSTALL SHEET-PIILING IN ALL AOCs. | | | | | | | | | | | | | | |
| 2. INSTALL AND OPERATE DEWATERING EQUIPMENT. | | | | | | | | | | | | | | |
| 3. MOBILIZE ALL NECESSARY EXCAVATION EQUIPMENT, HOLDING TANKS, AND TREATMENT EQUIPMENT. | | | | | | | | | | | | | | |
| 4. EXCAVATION AND BACKFILLING OF SURFACE AND SUBSURFACE SOILS. | | | | | | | | | | | | | | |
| 5. POST TREATMENT AND DISPOSAL OF SOILS AND WATER. | | | | | | | | | | | | | | |
| 6. DECONTAMINATION AND DEMOBILIZATION OF REMOVAL OPERATION EQUIPMENT. | | | | | | | | | | | | | | |
| 7. SITE RESTORATION AND ASPHALT ENCAPSULATION. | | | | | | | | | | | | | | |

■ ANTICIPATED TASK COMPLETION TIME

NOTE: A MORE DETAILED SCHEDULE OF CONSTRUCTION, OPERATION AND MAINTENANCE ACTIVITIES WILL BE INCLUDED IN THE REMEDIAL ACTION PLAN.


| | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|--------|
| Title: | | | |
| PRELIMINARY SCHEDULE OF
FIELD ACTIVITIES | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared for: | | | |
| MONSANTO COMPANY | | | |
| 
ROUX ASSOCIATES INC.
Environmental Consulting
& Management | Compiled by: P.J.P. | Date: 11/92 | Figure |
| | Prepared by: M.V. | Scale: NONE | |
| | Project Mgr: G.D.W. | Revision: | |
| | File No. 06606J-851 | | |
| | | | 36 |

Exhibit F
#1

EXHIBIT F

850131289

1993

FORM 10-K
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 1993

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

Commission file number 1-2516

MONSANTO COMPANY

(Exact name of registrant as specified in its charter)

DELAWARE

(State or other jurisdiction of
incorporation or organization)

43-0420020

(I.R.S. Employer
Identification No.)

800 NORTH LINDBERGH BLVD., ST. LOUIS, MO. 63167

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code **(314) 694-1000**

Securities Registered Pursuant to Section 12(b) of the Act:

Title of each class

Common Stock \$2 par value
Preferred Stock Purchase Rights

Name of each exchange
on which registered

New York Stock Exchange
New York Stock Exchange

Securities Registered Pursuant to Section 12(g) of the Act:

None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

State the aggregate market value of the voting stock held by nonaffiliates of the registrant: approximately \$9.1 billion as of the close of business on February 28, 1994.

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date: 118,614,871 shares of Common Stock, \$2 par value, outstanding at February 28, 1994.

Documents Incorporated by Reference

1. Portions of Monsanto Company Annual Report to security holders for the year ended December 31, 1993. (Parts I and II of Form 10-K.)
2. Portions of Monsanto Company Notice of Annual Meeting and Proxy Statement dated March 14, 1994. (Part III of Form 10-K.)

850131290

1992

FORM 10-K
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 1992

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

Commission file number 1-2516

MONSANTO COMPANY

(Exact name of registrant as specified in its charter)

DELAWARE

(State or other jurisdiction of
incorporation or organization)

43-0420020

(I.R.S. Employer
Identification No.)

800 NORTH LINDBERGH BLVD., ST. LOUIS, MO. 63167

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code **(314) 694-1000**

Securities Registered Pursuant to Section 12(b) of the Act:

| <u>Title of each class</u> | <u>Name of each exchange
on which registered</u> |
|-----------------------------------------|------------------------------------------------------|
| Common Stock \$2 par value | New York Stock Exchange |
| Preferred Stock Purchase Rights | New York Stock Exchange |
| 9 1/8% Sinking Fund Debentures due 2000 | New York Stock Exchange |

Securities Registered Pursuant to Section 12(g) of the Act:

None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

State the aggregate market value of the voting stock held by nonaffiliates of the registrant: approximately \$6.1 billion as of the close of business on February 26, 1993.

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date: 120,163,507 shares of Common Stock, \$2 par value, outstanding at February 26, 1993.

Documents Incorporated by Reference

1. Portions of Monsanto Company Annual Report to security holders for the year ended December 31, 1992. (Parts I and II of Form 10-K.)
2. Portions of Monsanto Company Notice of Annual Meeting and Proxy Statement dated March 19, 1993. (Part III of Form 10-K.)

850131291

FORM 10-K

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 1991

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

Commission file number 1-2516

MONSANTO COMPANY

(Exact name of registrant as specified in its charter)

DELAWARE(State or other jurisdiction of
incorporation or organization)43-0420020(I.R.S. Employer
Identification No.)800 NORTH LINDBERGH BLVD., ST. LOUIS, MO. 63167

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code (314) 694-1000

Securities Registered Pursuant to Section 12(b) of the Act:

| <u>Title of each class</u> | <u>Name of each exchange
on which registered</u> |
|--------------------------------------|------------------------------------------------------|
| Common Stock \$2 par value | New York Stock Exchange |
| Preferred Stock Purchase Rights | New York Stock Exchange |
| 9½% Sinking Fund Debentures due 2000 | New York Stock Exchange |
| 8½% Sinking Fund Debentures due 2000 | New York Stock Exchange |
| 8¾% Sinking Fund Debentures due 2008 | New York Stock Exchange |

Securities Registered Pursuant to Section 12(g) of the Act:

None

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

State the aggregate market value of the voting stock held by nonaffiliates of the registrant: approximately \$8.3 billion as of the close of business on February 28, 1992.

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date: 124,056,243 shares of Common Stock, \$2 par value, outstanding at February 28, 1992.

Documents Incorporated by Reference

1. Portions of Monsanto Company Annual Report to security holders for the year ended December 31, 1991. (Parts I and II of Form 10-K.)
2. Portions of Monsanto Company Notice of Annual Meeting and Proxy Statement dated March 20, 1992. (Part III of Form 10-K.)

Exhibit F

#2

REMEDIAL ACTION REPORT
Volume I of XIII

MONSANTO KEARNY PLANT
Kearny, New Jersey



Associates, Inc.

ENVIRONMENTAL CONSULTING & MANAGEMENT

850131294

**REMEDIAL ACTION REPORT
Volume I of XIII**

**MONSANTO KEARNY PLANT
Kearny, New Jersey**

November 11, 1994

Prepared for:

**MONSANTO COMPANY
Kearny, New Jersey**

Prepared by:

**ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066**



850131295

MO06634J.5.1

PREFACE

This Remedial Action Report (RAR) is comprised of XIII volumes. Volume I includes the report text, tables, figures, and plates. Volume II contains all appendices to the RAR, excluding the raw analytical laboratory reports and copies of hazardous waste manifests and certificates of disposal.

The raw analytical laboratory reports, copies of hazardous waste manifests and certificates of disposal have been included as Volumes III through XIII. Each volume contains an index which lists the volume contents for the reader's convenience.

VOLUME I OF XIII

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12. PCB Disposal Area Isoconcentration Map PCBs at 8 to 10 Foot Depth
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VOLUME II OF XIII

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- A. Administrative Consent Order
- B. Copy of RAWP Approval Letters
- C. Photo Journal of Remedial Action

- D. Non-Compliance Monitoring Well Abandonment Reports
- E. Well Sampling Data Logs
- F. Copy of Approved Soil Erosion and Sediment Control Plan Certification and Report of Compliance
- G. Copy of Approved Stream Encroachment/Waterfront Development Permit
- H. Copy of Dewatering System Permit and Well Records
- I. Copy of Dewatering System Well/Well Point Abandonment Form
- J. Copy of Conditional Discharge to Ground Water Permit Waiver and Treatment Works Approval Waiver
- K. Copy of Local Construction Permits
- L. Copy of Hudson Regional Health Commission Permits
- M. Emergency/Contingency Plan
- N. Data Validation Report
- O. Certificates of Clean Backfill
- P. Copy of Backfill Compaction Results
- Q. Copies of Scrap Tickets for Disposal of Injection Trench Steel
- R. Copy of Subbase and Asphalt Compaction Results
- S. Schedule of Remedial Action Activities
- T. Declaration of Environmental Restriction

VOLUME III OF XIII

- U. Analytical Support Documentation for Ground-Water Sampling Results (Part 1 of 2)

VOLUME IV OF XIII

- U. Analytical Support Documentation for Ground-Water Sampling Results (Part 2 of 2)
- V. Analytical Support Documentation for Air Monitoring Results

VOLUME V OF XIII

- W. Analytical Support Documentation for Post-Excavation Soil Sampling Results (Part 1 of 5)

VOLUME VI OF XIII

- W. Analytical Support Documentation for Post-Excavation Soil Sampling Results (Part 2 of 5)

VOLUME VII OF XIII

- W. Analytical Support Documentation for Post-Excavation Soil Sampling Results (Part 3 of 5)

VOLUME VIII OF XIII

- W. Analytical Support Documentation for Post-Excavation Soil Sampling Results (Part 4 of 5)

VOLUME IX OF XIII

- W. Analytical Support Documentation for Post-Excavation Soil Sampling Results (Part 5 of 5)

VOLUME X OF XIII

- X. Analytical Support Documentation for Post-Treatment Ground-Water Sampling Results (Part 1 of 2)

VOLUME XI OF XIII

- X. Analytical Support Documentation for Post-Treatment Ground-Water Sampling Results (Part 2 of 2)

VOLUME XII OF XIII

- Y. Copies of Hazardous Waste Manifests and Certificates of Disposal (Part 1 of 2)

VOLUME XIII OF XIII

- Y. Copies of Hazardous Waste Manifests and Certificates of Disposal (Part 2 of 2)
- Z. Analytical Support Documentation for Granular Activated Carbon Sampling Results

EXECUTIVE SUMMARY

Monsanto Company (Monsanto) owns and previously operated an industrial chemical plant located in Kearny, Hudson County, New Jersey (site). Manufacturing activities were terminated in December 1991, and facility decontamination and demolition are complete. An Administrative Consent Order (ACO)¹ to conduct a Remedial Investigation and Feasibility Study (RI/FS) was executed between Monsanto and the New Jersey Department of Environmental Protection (the Department) on June 24, 1989. The RI/FS process was completed in 1992. Upon notification of intended termination of site operations and submission of pertinent filing forms, the Department formally incorporated all Environmental Cleanup Responsibility Act (ECRA) requirements into the ACO in correspondence dated January 13, 1992².

Subsequent to the completion of the RI/FS process, a Remedial Design (RD) and Remedial Action Workplan (RAWP) were initiated and completed in 1993. The RAWP was conditionally approved by the Department on November 18, 1993³ with final approval granted on March 28, 1994⁴. Remedial Action (RA) activities required by the approval of the RAWP were initiated and completed in 1994 and are described in this Remedial Action Report (RAR).

As described in subsequent sections of this RAR, hot-spot removal of impacted soils from three separate areas of concern (AOCs) and surface capping were performed. The RA activities completed were broken down into ten basic tasks. The first task included acquisition of all required permits; the second task included mobilization of equipment, materials and personnel; the third included installation of construction support facilities and temporary controls. The fourth task included installation of steel sheet-piling; the fifth task included installation and operation of the dewatering and treatment systems. The sixth task included excavation and backfilling of all AOCs; the seventh task included the treatment and disposal of soils and water (i.e. loading, transportation, and disposal of soils and treatment of water); the eighth task included preparation for capping; the ninth task included installation of the asphalt cap; and the last task involved reporting requirements.

Upon completion of its ACO and ECRA, now the Industrial Site Recovery Act (ISRA), obligations at the site, Monsanto intends to sell the property and improvements for non-residential operations.

1.0 INTRODUCTION

Monsanto owns and previously operated an industrial chemical plant located on Pennsylvania Avenue in Kearny, New Jersey. The site manufactured detergent ingredients until December 1991, when production ceased. A site location map and a pre-demolition site plan are provided as Figures 1 and 2, respectively. The facility decontamination and demolition are complete, and a site plan showing post-demolition conditions is included as Figure 3. All RI/FS, RD, and RA procedures have been completed at this site, and the Remedial Action Report (RAR) is presented herein.

The Department's requirements for submission of a RAR are presented N.J.A.C. 7:26E entitled *Technical Requirements for Site Remediation* (Technical Rules)⁵. This RAR has been written to include all the Technical Requirements included in the Department's format as outlined in N.J.A.C. 7:26E-6.6. The organization of this RAR is presented below.

This report is divided into 8 sections with tables, figures, plates, and appendices located at the end of the report. Section 2.0 provides background information and summarizes the RI report which was previously submitted to the Department. A summary of the Remedial Action Workplan is included in Section 3.0. Section 4.0 includes a summary of activities conducted during the RA. Sections 5.0 and 6.0 include RA costs and Operation and Maintenance (O&M) and reporting requirements associated with ground-water monitoring and asphalt cap maintenance, respectively. Section 7.0 presents a summary of Declaration of Environmental Restrictions. Finally, Section 8.0 includes findings and conclusions.

2.0 REMEDIAL INVESTIGATION SUMMARY

A series of site investigations, both prior to and after execution of the ACO, resulted in Department approval of the RI on May 7, 1992⁶. The final RI report provides comprehensive coverage of all of the investigative work completed at the site. A complete summary of the RI activities and associated findings was presented in the final Focused Feasibility Study (FFS)⁷ dated June 18, 1993 and the RAWP⁸ dated August 4, 1993. This section summarizes information presented in the RI Report. More detailed information which supports the summary below is located in the text, tables, figures and appendices of the RI Report. Summaries of the manufacturing history, regulatory history, previous investigations, site setting, site geology, site hydrogeology, and the analytical results are summarized below.

2.1 Manufacturing History

The Monsanto Kearny plant began process operations in 1955. The plant manufactured phosphoric acid and sodium tripolyphosphate (STP) from 1955 until 1985. These process units were located in the eastern part of the plant site. In 1966, new production units for the phosphoric acid and STP processes were added. These operations were terminated in 1985, and the units were subsequently dismantled. The manufacturing of steroxes began in 1956, followed by alkylphenol (AP) production in 1960. AP was manufactured on site until 1991, with the process units previously located in the central portion of the site. Sterox production ended in 1990; these process units were located adjacent to the AP units. A chronological summary of primary process operations is presented in Table 1, and a pre-demolition site plan is shown as Figure 2. At the present time, there are no manufacturing activities conducted at the site, and the only remaining buildings are the former warehouse and office (see Figure 3).

The RI Report contains a complete description of each manufacturing process, including the raw and waste materials and disposal practices associated with each product. This information was gathered through historical file review and interviewing plant personnel regarding site operations. The design of the RI Workplan was based on a thorough understanding of the manufacturing history. One particular aspect of the manufacturing history which warrants a brief explanation in this RAR is described below.

From 1960 to 1972, the heat-transfer fluid used in the thermal system for the AP process contained polychlorinated biphenyls (PCBs), which were used for their fire-resistant and relatively inert characteristics. During a process upset in 1967-68, the reactants accidentally mixed into the thermal circulating system. Upon recirculating back into the storage tank, the mixture became gel-like and unusable. A disposal pit was excavated next to the control room and approximately 2,000 gallons of PCB thermal fluid were drained from the tank and heater to an excavated pit which is currently referred to as the PCB Disposal Area (PDA). The thermal system was recharged with PCB heat transfer fluid at that time. When the system was converted in 1972 to a non-PCB fluid, the tank containing 2,000 gallons of PCB thermal fluid was again drained to the PDA. In 1979, preliminary cleanup of the PDA was conducted by excavation and proper disposal of approximately 85 cubic yards of PCB saturated soils. The PDA is the primary AOC at the site and is shown as one of the three areas to be addressed on Figure 4.

2.2 Regulatory History

Monsanto entered into an ACO with the Department on June 24, 1989 to implement a RI/FS. A copy of the ACO is presented as Appendix A. Using information from earlier investigations, and in compliance with the ACO, Roux Associates, Inc. developed a Remedial Investigation Workplan (RI Workplan)⁹, dated December 18, 1989, a RI Workplan-Addendum I (Addendum I)¹⁰, dated May 18, 1990, and subsequently a Revised RI Workplan-Addendum II (Addendum II)¹¹, dated May 5, 1991. The RI Workplan and subsequent Addenda I and II, were commented on and modified by Department personnel to ensure full characterization of site conditions.

The RI was performed to evaluate the sources and extent of PCBs and other compounds of concern in the soils and ground water and to identify potential migration pathways for these compounds. Upon completion of all field activities, a Preliminary Remedial Investigation Report (Volumes I, II, and III)¹² was submitted to the Department on August 30, 1991. A series of correspondence between Roux Associates, Inc., Monsanto and the Department served to resolve several questions and concerns. Monsanto received a conditional approval of the RI Report in correspondence dated May 7, 1992 and was directed to submit a draft FS Workplan (FSWP).

In accordance with correspondence dated September 16, 1992¹³ from the Department to Monsanto, an FFS report was submitted in lieu of a Draft and Final FSWP and FS. In this

correspondence, the Department confirmed that this alternative to submission of the ACO-required FSWP and FS was deemed acceptable since the AOCs at the site had been fully characterized, are media specific, and are of limited extent. The FFS had been designed to identify remedial alternatives, select the most appropriate remedial action, and petition for soil cleanup standards (SCSs) for surface and subsurface soils on the site. A chronology of additional regulatory milestones is discussed in further detail in Subsection 3.1

2.3 Previous Investigations

Subsurface investigation activities began at the Monsanto Kearny Plant in the early 1970s and continued through the completion of the RI Report. The findings and conclusions for this site have been based on a comprehensive series of investigations which have been presented in detail in the RI Report. Most of the investigations were designed to build upon and refine the information from earlier investigations. A brief description of the chronology of site investigation activities is presented below.

- | | | |
|----------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| • Monsanto | 1970s | Reviewed historical operating practices and prioritized potential areas of concern. |
| • Monsanto | 1982 | Initiated plant program to assess subsurface environmental quality and prevent future releases. |
| • Monsanto | 1983 | Installed 8 ground-water monitoring wells. |
| • Storch Engineers | 1983 | Collected 5 surface soil samples and drilled and sampled 29 soil borings in the original PCB disposal area (PDA). |
| • OH Materials Corp. | 1984 | <p><u>Phase I</u>: Drilled and sampled 10 soil borings in the AP/Sterox process area. Installed and sampled four ground-water cluster well sets and one single well. Excavated 4 test pits in immediate area of cluster wells.</p> <p><u>Phase II</u>: Conducted water-level gauging. Installed and sampled 6 soil borings in secondary settling pond area.</p> |
| • OH Materials Corp. | 1985 | <p><u>Phase III</u>: Excavated 13 test pits in the general AP/Sterox process area.</p> <p><u>Phase IV</u>: Installed and sampled 3 additional soil borings. Conducted permeability testing.</p> |
| • Monsanto | 1985 | Conducted ground-water sampling. |

- OH Materials Corp. 1986 Conducted ground-water sampling. Implemented interim remedial measures.
- OH Materials Corp. 1987 Conducted ground-water sampling.
- Roux Associates, Inc. 1988 Conducted ground-water sampling.
- Roux Associates, Inc. 1990 Installed 14 ground-water monitoring wells and 9 observation points. Abandoned 5 ground-water monitoring wells.
 Conducted quarterly ground-water gauging and sampling of 26 monitoring wells - June, August, September and December.
 Conducted air quality monitoring and analysis study.
 Completed ground-water recovery test to determine hydraulic characteristics.
 Conducted Phase I soil investigation which included a series of surface soil samples and subsurface soil borings.
 Completed 8-day tidal influence study.
- Roux Associates, Inc. 1991 Completed quarterly ground-water gauging and sampling in March.
 Conducted Phase II soil investigation which included a series of surface soil samples and subsurface soil borings.
- Roux Associates, Inc. 1992 Abandoned 9 ground-water monitoring wells.
- Roux Associates, Inc. 1993 Conducted RCRA characterization sampling of areas of concern, geotechnical testing, aerial photography/site topography survey.

2.4 Site Setting

The Monsanto Kearny Facility is located on Pennsylvania Avenue in the town of Kearny, Hudson County, New Jersey. The site is bordered by the Passaic River on the west, a Conrail Railroad Yard on the north, and to the south and east by warehouses and trucking distribution facilities. The facility occupies approximately 28 acres in Kearny Point, a highly industrialized area of Kearny. The plant site is located on the east bank of the Passaic River, approximately 1.6 miles north of its confluence with the Hackensack River at Newark Bay. Occupancy in the immediate area includes major manufacturing, distribution, and transportation facilities.

The residential area of Kearny is located approximately 2 miles northwest of the plant with an approximate population of 36,000. Harrison, with a population of approximately 12,250 is also located approximately 2 miles west-northwest of the Monsanto facility. The closest residential area, the City of Newark, is located approximately 1 mile west-southwest of the facility, across the Passaic River.

The plant site was used as a rail yard prior to purchase and development by Monsanto in the early 1950s. Recent plant operations included the manufacturing of alkylphenols and the warehousing and distribution of other Monsanto products. The site and the surrounding properties are clearly non-residential properties based on current uses. Any foreseeable future operations in this neighborhood would be expected to fall within Standard Industrial Classification (SIC) codes clearly associated with non-residential properties. A Declaration of Environmental Restriction previously presented in the RAWP and further discussed in Section 7.0 will be employed to ensure the future use of the property is limited to non-residential applications.

2.5 Site Geology

Subsurface investigations conducted to date by Monsanto and Roux Associates, Inc. have indicated the presence of at least four distinct geologic units in the shallow subsurface beneath the site. Numerous borings and test pits were performed to characterize the stratigraphy of the unconsolidated sediments. Geologic literature shows that the stratigraphy described for the site is typical for the area. Figure 5 shows the location of current and former monitoring wells and includes the location of hydrogeologic transects. Two site-specific geologic cross sections are presented as Figures 6 and 7, respectively. Complete documentation of geologic findings including geologic logs of all borings can be found in the RI Report. The four shallow stratigraphic units encountered beneath the site are described as follow:

- The uppermost unit consists of 2 to 7 feet of fill material, underlain by approximately 5 feet of silty medium to coarse sand with gravel. From the surface of the site, the first unit ranges in thickness between 7 and 12 feet. This unit is thinnest adjacent to the Passaic River located on the southwest boundary of the site and is thickest in the central part of the site.

- The second stratigraphic unit consists of peat and clay. It begins at an average depth of approximately 12 feet below ground surface (BGS), and ranges in thickness between 5 and 8 feet. It is thickest adjacent to the Passaic River. It has a low permeability and is a locally continuous, natural confining unit. Prior to development of this site for industrial use, this may have been the original ground surface.
- The third stratigraphic unit consists of coarse sand with some silt and gravel. It begins at an average depth of 18 feet BGS. This unit has an average thickness of approximately 10 feet across the site and is thickest on the eastern portion of the site.
- The fourth stratigraphic unit, encountered at approximately 28 feet BGS, consists of alternating silt and clay laminations which form thin light and dark colored bands. This stratified deposit is typical of sediments deposited by glacial meltwater in lakes (glacio-lacustrine deposits) during the end of the Pleistocene Ice Age. Review of well records of ground-water wells within 1 mile of the site and regional geologic literature indicates that the thickness of this Pleistocene age lacustrine clay varies from 30 to 50 feet. This unit has a very low permeability and is considered a hydraulic barrier between the recent fluvial sediments and the underlying Triassic Age bedrock.

2.6 Site Hydrogeology

Hydrogeologic and subsurface investigations conducted by Monsanto and Roux Associates, Inc. have indicated the presence of two water-bearing zones within the upper 30 feet of sediment, separated by a locally continuous, natural confining unit of peat and clay. A relatively impermeable boundary of silt and clay lies below the two water-bearing zones. The two water-bearing zones beneath the site are not sources of drinking water due to the shallow depth to the upper water-bearing zone and the saline characteristics of the lower water-bearing zone. Both water-bearing zones discharge to the Passaic River, which is tidally influenced.

The upper water-bearing zone occurs within the first lithologic unit of fill material and coarse sand. It is an unconfined water-bearing zone, and the water table occurs between 2 to 4 feet BGS. In the upper water-bearing zone limited tidal influence has been observed during high tides.

The lower water-bearing zone occurs within the third lithologic unit which consists of coarse sand with some silt and gravel. The unit is completely saturated with water and confined between two semi-permeable lithologic units. The static head rises above the overlying peat and clay unit, separating the upper and lower unconsolidated water-bearing zones. The hydraulic head data from well couplets screened in the upper and lower water-bearing zones reveals a downward vertical hydraulic gradient across the entire site. A distinct tidal influence was observed in the lower water-bearing zone, and ground-water chemistry shows elevated concentrations of constituents of saline water.

2.7 Analytical Results

Subsurface investigation activities began at the site in the early 1970s and continued through the completion of the RI Report. A brief description of the chronology of previous site investigation activities was provided in Subsection 2.3. A comprehensive presentation which describes and integrates the findings from all of the site investigations is provided in the RI Report. In the preliminary site investigations, five areas of concern were identified as the Acid Sump (AS), Alkylphenol/Sterox Sump (APSS), Secondary Settling Pond (SSP), Tertiary Settling Pond (TSP), and the PCB Disposal Area (PDA). Surface and subsurface soils in these five potential AOCs were further investigated in the RI, and the AS and TSP were eliminated as AOCs. The ground water beneath the site was fully evaluated during the RI, and the impact was considered limited.

In correspondence dated September 16, 1992, the Department identified that the AOCs at the site had been fully characterized, are media-specific, and are of limited extent. The Department and Monsanto agreed that the three AOCs include the PDA, the APSS and the SSP. The media of concern for each of these areas is surface and/or subsurface soils which are primarily impacted by PCBs. Any low-level, residuals outside of these AOCs were managed by the engineering and institutional control aspects of the proposed remedial action. The impact to ground water is limited and primarily the result of background conditions which are consistent with the known industrial setting of the facility. A series of PCB isoconcentration maps for soils in the PDA, APSS, and SSP are included as Figures 8 through 22, 23 and 24, and 25 and 26, respectively. A summary of the pertinent analytical conclusions for each of the three AOCs is provided in the subsections below.

2.7.1 PCB Disposal Area (PDA)

The PDA has been sampled extensively over time. The former horizontal distribution of PCBs in surface soils is shown on Figure 8, and the former vertical distribution over two-foot intervals is depicted in Figures 9 through 22. As indicated in the figures, the maximum concentrations were present at the 4 to 6 foot interval BGS with a significant decreasing trend to a depth of 10 to 12 feet BGS. There was a slight increase observed from 12 to 16 feet BGS within the confining peat layer. As shown, the concentrations of PCBs in surface soils ranged from non-detect to approximately 30,000 ppm in the core of the PDA. The subsurface soil exhibited maximum concentrations of approximately 400,000 ppm at the 4 to 6 foot interval.

2.7.2 Alkylphenol/Sterox Sump (APSS)

The APSS was targeted for investigation based on its historical use as a waste washwater sump. According to plant personnel, the APSS served as a collection point for washwater which collected in concrete troughs beneath the process area. The APSS was manually cleaned of settled solid wastes which were disposed off site. This unit was sampled at the 4 to 6 foot and 9 to 11 foot intervals, and former PCB isoconcentration maps are shown as Figures 23 and 24. As shown, the concentrations were several orders of magnitude less than the PDA. The higher concentrations had been detected at 4 to 6 feet BGS which corresponds to the nominal depth of this unit.

2.7.3 Secondary Settling Pond (SSP)

The SSP was operated from about 1960 to 1977. As described in the subsection above, waste washwater was directed to the APSS. However, during heavy rainfall the APSS unit could not handle the influent water and overflow was directed to the SSP by an underground terra-cotta pipe. Residual materials were carried to the SSP by this mechanism. Figures 25 and 26 show the former PCB distribution in the SSP at the 4 to 6 and 9 to 11 foot intervals, respectively. The PCB levels in the SSP were in the range, but lower than the APSS, and many orders of magnitude less than the PDA. Like the other two AOCs, the highest concentration was observed at the 4 to 6 foot interval BGS.

2.7.4 Ground Water

Quarterly ground-water monitoring was conducted between June 1990 and June 1991. Twenty-six ground-water wells were used to monitor both the upper and lower water-bearing zones. The results identified several volatile and semivolatile compounds and PCBs at concentrations below levels of potential concern. In the lower water-bearing zone, elevated levels of chlorobenzene were identified; however, there is no known on site source and the highest concentrations were measured in upgradient wells.

3.0 REMEDIAL ACTION WORKPLAN SUMMARY

This section includes a discussion on the regulatory history of the site leading up to the submission of this RAR, applicable remediation standards, and a summary of the Department-approved RA scope of work.

3.1 Regulatory History

As previously described in Subsection 2.2, Monsanto entered into an ACO with the Department on June 24, 1989 to implement an RI/FS. In compliance with the ACO, Roux Associates, Inc. and Monsanto submitted the following critical documents identified below to meet the intent of the ACO and obtain regulatory closure for the Monsanto Kearny site. A brief chronological history of regulatory milestones following the execution of the ACO is presented as follows:

- June 24, 1989 Monsanto enters into an ACO with the Department.
- December 18, 1989 Roux Associates, Inc. developed a "Remedial Investigation Workplan" (RI Workplan).
- May 18, 1990 Roux Associates, Inc. developed a "RI Workplan Addendum I".
- May 5, 1991 Roux Associates, Inc. developed a "RI Workplan Addendum II".
- August 30, 1991 A "Preliminary Remedial Investigation Report" was submitted to the Department.
- May 7, 1992 Monsanto received conditional approval of the RI Report and was directed to submit a draft FS Workplan (FSWP).
- September 16, 1992 Department correspondence to Monsanto stating that a "Focused Feasibility Study" may be submitted in lieu of a draft and final FSWP and FS.
- April 18, 1993 A draft Focused Feasibility Study was submitted to the Department for approval.
- June 7, 1993 The Department conditionally approved Monsanto's FFS.
- June 18, 1993 A final "Focused Feasibility Study and Identification of Site Specific Clean-Up Standards" was submitted to the Department.
- August 4, 1993 Roux Associates, Inc. developed and submitted a "Preliminary Remedial Action Workplan" for Department Approval.
- November 18, 1993 Monsanto received conditional approval of the RAWP from the Department.
- March 28, 1994 Monsanto received final approval of the RAWP.
- April 4, 1994 Remedial activities commenced at the Kearny site.

- June 10, 1994 Monsanto received list of Administrative Requirements necessary for ACO/ISRA closure.
- August 25, 1994 Remedial activities are completed at the Kearny site.

This report concludes the regulatory reporting obligations of the ACO for remedial activities performed during 1994. Additional future reporting required as part of the long-term maintenance program is later discussed in Section 6.0.

3.2 Applicable Remediation Standards

In the RI, it was concluded that polychlorinated biphenyls (PCBs) in surface and subsurface soils were the constituents of concern at the site. Natural site hydrogeologic conditions and the general immobility of PCBs have prevented any significant migration of PCBs in soils or ground water beyond the three AOCs. As discussed in the RI summary, the surrounding neighborhood is expected to remain non-residential and deed restrictions are being employed by Monsanto to control the future use of this site. Furthermore, as previously presented in the Department-approved RAWP, Monsanto had agreed to certain pre-approved remedial objectives including hot spot removal of PCB-impacted soils and the implementation of engineering controls. As a result of these natural site features and proposed remedial conditions, the Department approved applicable remediation standards which allowed for a timely and appropriate remedy for the site. Copies of the RAWP approval letters are included as Appendix B.

Based on the Department's approval, the following site-specific cleanup standards (SCSs) were presented and approved as applicable remediation standards:

- Remediation of surface soils (0-2 feet below ground surface) was proposed and approved for PCBs in the three defined AOCs. An SCS for surface soils of 25 milligrams per kilogram (mg/kg) total PCBs was the approved and applicable site-specific remediation standard for a non-residential area where engineering and institutional controls will be employed.
- Remediation of subsurface soils was also proposed for PCBs in the three defined AOCs. The Department's subsurface cleanup guidance level of 100 mg/kg total PCBs was the

approved and applicable site-specific remediation standard which was met in each of the three AOCs including those soils within and below the confining peat layer in the PCB Disposal Area (PDA).

- Remediation of ground water was not required in the Department-approved FFS. The identified impact to ground water is limited, and those few compounds exceeding the proposed cleanup standards in the shallow ground-water zone represent industrial background conditions for the area. Post-remedial action compliance monitoring of the ground water had been proposed and is later described in Subsection 6.1 of this RAR.

3.3 Remedial Action Scope of Work

The RA consisted of hot-spot removal of three separate PCB-impacted areas of concern (AOCs): the PCB Disposal Area (PDA); the A/P Sterox Sump (APSS); and the Secondary Setting Pond (SSP). Installation of an asphalt cap over the AOCs and adjacent areas was also performed. The location of the three AOCs is shown on Figure 4. The RA activities that were performed were divided into ten basic tasks:

1. Acquisition of all required permits
2. Mobilization of equipment, materials and personnel
3. Installation of construction support facilities and temporary controls
4. Installation of steel sheet-piling
5. Installation and operation of dewatering and water treatment system
6. Excavation and backfilling of all AOCs
7. Transportation and disposal of contaminated soil, construction debris, filtration media, and treated water
8. Preparation for capping
9. Installation of asphalt cap
10. Reporting requirements

A summary of each of these tasks is outlined below with additional detail provided in later sections of this RAR. A photo journal presenting photographs of key RA activities is presented as Appendix C. The location of each photo included in the journal is attached as Figure 27.

1. *Acquisition of all required permits.*

Prior to on site construction activities, the following permits were secured:

- Soil Erosion and Sediment Control Plan Permit.
- Minor Stream Encroachment Permit
- Waterfront Development Permit
- Dewatering System Permit
- Discharge to Groundwater Permit Waiver
- Treatment Works Approval Permit Waiver
- Local Construction Permits (Town of Kearny)
- Hudson Regional Health Commission Permits

A discussion of each of these permits has been included as Subsection 4.1.3.

2. *Mobilization of equipment, materials and personnel.*

Equipment, materials and personnel were mobilized to the site to implement the RA upon receipt of all required permits. Equipment mobilized included earth moving equipment, water treatment system equipment, and other construction support equipment. Materials mobilized included geosynthetic liner material, erosion control devices, steel sheeting, backfill material and asphalt capping materials. Personnel mobilized included project managers and engineers, health and safety personnel, and field construction personnel.

3. *Installation of construction support facilities and temporary controls.*

Construction support facilities included the equipment decontamination area, contamination reduction zone, soil handling area, command post and first aid station, water treatment area, construction access roads, and parking area.

An equipment decontamination area was constructed such that all construction equipment, including excavation equipment and dump trucks, that came in contact with contaminated soil and/or water was decontaminated prior to leaving the site.

The equipment decontamination area was designed to form a closed, shallow impermeable basin to prevent the spread of contamination outside the equipment decontamination area during decontamination activities.

A contamination reduction zone was constructed at the perimeter of the exclusion zone which served as an area for decontamination of personnel and collection of spent personal protective equipment (PPE).

The soil handling area was used as an area to stockpile soil and as an area to drain and condition the soil as necessary. Dump trucks used for transportation of contaminated soils were also loaded from the soil handling area.

A command post (office trailer) and first aid station complete with utilities was on site throughout the RA. The command post served as the office for construction personnel.

A water treatment area was constructed to treat extracted groundwater to acceptable levels prior to discharge. Access roads and parking areas were constructed to facilitate construction activities.

Temporary controls included site security and temporary fencing (in the area of construction activities), temporary utilities (electricity, telephone, potable water, decontamination water, and sanitary facilities), soil erosion and sediment control devices, and progress cleaning. The location of construction support facilities and temporary controls are shown on Figure 28.

4. Installation of steel sheet piling.

In order to safely and effectively conduct soil removal operations, steel sheet-piling was installed as a vertical barrier around the perimeter of each AOC. The approximate areas enclosed in each AOC were as follows:

| | |
|----------------------|-----------------|
| PDA (inner sheeting) | 47' x 36' x 35' |
| PDA (outer sheeting) | 67' x 80' x 22' |

| | |
|------|-----------------|
| APSS | 40' x 53' x 22' |
| SSP | 21' x 34' x 22' |

The sheet-piling was designed to form a complete impermeable barrier around the perimeter of each AOC. The sheet-piling isolated each AOC from horizontal ground-water flow and allowed for effective dewatering operations necessary for soil excavation activities. The sheeting was left in place following soil removal and backfilling operations to continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within non-excavated soils.

5. *Installation and operation of dewatering and water treatment system.*

Following the installation of the sheet-piling in all three AOCs, dewatering equipment was installed in each AOC. Each AOC was dewatered to near or below the proposed depth of excavation, and dewatering operations continued as necessary to facilitate soil removal operations.

All water generated from dewatering operations was transferred via a pumping system from the AOCs to clarifiers, as later described in Subsection 4.2.10 and through a treatment system to an approved discharge point. The function of the treatment system was to remove suspended sediments via bag filtration and carbon polishing for any remaining dissolved-phase PCBs. All carbon used to polish ground water prior to discharge was disposed of at a permitted disposal facility following completion of on site operations. The final disposition of treated ground water was via discharge to an on site injection trench.

6. *Excavation and backfilling of AOCs.*

Following the installation of the vertical barrier and dewatering systems, excavation of the three AOCs commenced using track-mounted excavators capable of reaching a depth of approximately 24 feet below ground surface (BGS) from the side of the largest excavation (the PDA). Removal activities were conducted in the three AOCs to an estimated maximum depth of 24 feet BGS in the inner PDA and 9 feet BGS in the outer PDA, APSS and SSP. Approximately 5,500 tons of soil required excavation and subsequent disposal.

Following the removal of soils from each AOC, the areas were backfilled using certified clean backfill material brought on site specifically for this purpose. In the PDA, where the existing peat layer was penetrated, a soil/bentonite mixture was used to replace this layer.

7. Transportation and disposal of contaminated soil, construction debris, filtration media, and treated water.

Waste materials which required transportation and off site treatment or disposal included excavated soils, granular activated carbon, personal protective equipment and miscellaneous site debris. The excavated soils were the largest waste stream intended for off site transportation and disposal. These soils were previously characterized and determined to be non-Resource Conservation and Recovery Act (RCRA) hazardous materials and were disposed at Chemical Waste Management's, Model City, New York Toxic Substances Control Act (TSCA)-approved and permitted landfill. Similar handling was performed for all other non-aqueous waste materials generated during RA activities. The aqueous waste stream was discharged on site after on site treatment.

8. Preparation for capping

Following excavation and backfilling activities, the site was prepared for capping. Preparation for capping included the demolition, removal and disposal of excess surface debris and foundation pads in the area slated for capping.

9. Installation of asphalt cap

The asphalt cap was installed over an area approximately 470 feet long by 290 feet wide. The cap consisted of a 6-inch thick layer of asphalt over a 6-inch crushed stone subbase. The primary purpose of the asphalt cap is to eliminate access to surface soils which may contain trace PCBs that are above the Department's direct residential guidance contact level of 0.49 mg/kg PCBs.

10. Reporting Requirements

Reporting requirements adhered to during the RA included monthly progress reporting during remedial activities in accordance with N.J.A.C. 7:26E-6.5; quarterly reporting as required by the ACO; and submission of a post-remedial action completion report or RAR as required

in N.J.A.C. 7:26E-6.6. The submission of this RAR will complete all reporting requirements required by the ACO, N.J.A.C. 7:26-6.5, and N.J.A.C. 7:26-6.6 with the exception of operations and maintenance reporting requirements later discussed in Subsection 6.1.

4.0 REMEDIAL ACTION SUMMARY

4.1 Pre-Remedial Action Activities

The following subsections discuss the activities that took place prior to mobilization and commencement of remedial activities. These Pre-Remedial Action activities included non-compliance monitoring well abandonment; Pre-Remedial Action ground-water sampling; acquisition of required permits; project organization; and health and safety.

4.1.1 Non-Compliance Monitoring Well Abandonment

Prior to initiating remedial activities, abandonment of non-compliance monitoring wells was performed so that remedial activities could commence with less probability of contamination migration through existing pathways to the lower water-bearing zones beneath the site. Non-compliance monitoring wells MW-1, MW-4, MW-5, MW-6S, MW-6D, MW-7S, MW-7D, MW-15D, and MW-16 were abandoned on April 4, 1994 by A.C. Schultes, Inc., a New Jersey-licensed well driller certified to seal wells. All work was supervised by a Roux Associates, Inc. engineer.

Well abandonment activities were performed in accordance with N.J.A.C. 7:9-9 *et seq*¹⁴. The location of abandoned non-compliance monitoring wells is shown on Figure 5. Non-compliance monitoring well abandonment reports are included in Appendix D.

4.1.2 Pre-Remedial Action Ground-Water Sampling

Base-line ground-water sampling of compliance monitoring well locations was conducted on April 14, 1994 prior to intrusive RA activities. The purpose of this ground-water sampling event was to establish a base-line of the extent of PCB contamination of ground water existing in upgradient and downgradient locations prior to RA activities. This data coupled with data gathered during long-term post-RA ground-water sampling will be used to draw conclusions regarding the effectiveness of the RA for ground water.

Base-line ground-water sampling was conducted at 8 compliance monitoring well locations including MW-8S, MW-8D, MW-10S, MW-10D, MW-13S, MW-13D, MW-14S, and MW-14D. These wells were proposed and approved as compliance monitoring wells in the RAWP and are shown in Figure 5. Ground-water samples were collected in accordance with both the

Department's May 1992 Field Sampling Procedures Manual¹⁵ and the Quality Assurance Project Plan (QAPP) previously submitted in the approved RAWP. Additional detail regarding sampling protocols has been provided in Section 4.3.1.

All ground-water samples including field blanks were analyzed for individual PCB congeners utilizing United States Environmental Protection Agency (USEPA) Method 8080. The practical quantitation limit (PQL) of this analytical method is 0.5 microgram per liter ($\mu\text{g}/\ell$). The ground-water sampling data collected during the RA was reported in a manner consistent with the New Jersey Reduced Deliverables Format with over 25% of the data reported in the New Jersey Regulatory Data Package as required by the approved RAWP. Base-line ground-water sampling results from all eight compliance monitoring wells were non-detect above the 0.25 $\mu\text{g}/\ell$ reporting limits. These results are also summarized in Table 2. Analytical support documentation for the baseline ground-water sampling event is included as Appendix U. Copies of Well Sampling Data Logs are provided in Appendix E.

4.1.3 Acquisition of Required Permits

The requirements of federal, state and local authorities were reviewed during preparation of the RAWP to determine which specific permits or approvals would be required prior to initiating RA activities. Those permits found to be necessary were completed and submitted prior to mobilization. A brief description of the applicability, purpose and scope of each required permit is presented below.

4.1.3.1 Soil Erosion and Sediment Control Plan Approval

One of the initial permits applied for was from the Hudson-Essex-Passaic Soil Conservation District for a Soil Erosion and Sediment Control Plan (SESCP) approval prior to performing construction activities. The SESCO is required for projects which disturb more than 5,000 square feet of land surface area and involve clearing and grading of land to be used for purposes other than agricultural or horticultural. Specific requirements of the approved SESCO including the installation of soil erosion and sediment control devices are discussed in further detail in Subsection 4.2.3.5. A copy of the approved SESCO and a Report of Compliance which was issued upon completion of RA activities has been included as Appendix F.

4.1.3.2 Stream Encroachment Permit

The Department's Division of Coastal Resources has a procedure for the review of plans involving the construction, installation, or alteration of any structure or permanent fill along, in, or across the channel or 100-year flood plain of any stream. This procedure also applies to projects that will cause alteration of a stream or the flood plain of a stream within a drainage basin of 50 acres or greater. Following a detailed evaluation of proposed RA activities in relation to the 100-year flood plain of the Passaic River, it was determined that a Minor Stream Encroachment Permit was required. This permit was applied for and issued jointly with a Waterfront Development Permit (see Subsection 4.1.3.3). A copy of the approved Stream Encroachment/Waterfront Development Permit is included as Appendix G.

4.1.3.3 Waterfront Development Permit

The Department's Division of Coastal Resources also requires a Waterfront Development Permit for development of waterfront upon any tidal or navigable waterway and lands lying thereunder up to the mean high water line. Following several conversations with appropriate Department personnel, it was determined that this permit was also applicable for the proposed RA. As previously discussed, this permit was applied for and issued jointly with a Minor Stream Encroachment Permit. A copy of the approved Stream Encroachment/Waterfront Development Permit is included as Appendix G.

4.1.3.4 Dewatering System Permit

The Department's Bureau of Water Allocation requires a Dewatering System Permit for the installation of dewatering wells or well points for use in a dewatering system. Dewatering wells must be constructed and sealed by a New Jersey-licensed dewatering contractor. A Dewatering System Permit was found to be applicable and was secured by the drilling subcontractor prior to the start of drilling operations. Dewatering System Well Records were submitted to the Department upon installation of the dewatering wells as required. A copy of the approved Dewatering System Permit and Dewatering System Well Records are included as Appendix H. After completion of dewatering activities, the dewatering wells were sealed in accordance with Department-approved procedures including the submission of a completed Dewatering System Well/Well Point Abandonment form. The Dewatering System Well/Well Point Abandonment forms are included as Appendix I.

4.1.3.5 Discharge to Ground Water Permit Waiver

Prior to mobilizing to begin RA activities, requirements for a New Jersey Pollutant Discharge Elimination System (NJPDES)-Discharge to Ground Water (DGW) Permit were conditionally waived by the Department for the proposed treated-water discharge option selected. The conditions for granting this waiver were that PCBs must be treated to non-detectable levels and that any free floating product, if encountered, must be removed prior to discharge. Additional conditions required that the ground-water flow rates not exceed 70 gallons per minute (gpm) or 100,000 gallons per day (gpd) and that ground-water discharge remain within the confines of the injection trench. This waiver was authorized in a letter from the Department dated March 28, 1994. A copy of this letter is included as Appendix J.

4.1.3.6 Treatment Works Approval Waiver

In addition to the request for a DGW permit waiver, a waiver for a Treatment Works Approval (TWA), required for the operation of a ground-water treatment system, was also requested. Since the treatment system would be operated only during RA activities and removed upon completion, this waiver was also authorized by the Department in their March 28, 1994 correspondence. As previously stated, a copy of this letter is included as Appendix J.

4.1.3.7 Local Construction Permits

The only local construction permits required for the RA by the Town of Kearny included a Building Permit, a certificate of occupancy/zoning permit, and an electrical permit for installation of the Command Post office trailers and temporary electrical service. These permits were submitted and approved by the Town of Kearny, New Jersey Construction Code Enforcement Department. Copies of these permits are included as Appendix K.

4.1.3.8 Hudson Regional Health Commission Permits

During evaluation of required permits, additional requirements necessary to perform RA activities were found to be required by the Hudson Regional Health Commission (HRHC). The HRHC was established pursuant to N.J.S.A. 26:3 et. seq. and serves the twelve municipalities of Hudson County.

Under the Authority of the County Environmental Health Act, the HRHC has been designated by the Department as the lead agency of the provision of environmental health programs in

Hudson County. These programs include Air Pollution Control, Noise Pollution, Emergency Response, Hazardous Substances Control and Water Pollution Control.

The Hazardous Substance Control Code of the HRHC requires that persons responsible for a site upon which RA activities are being conducted obtain appropriate Certificates of Registration from the HRHC.

Four Certificates of Registration were required from the HRHC in order to implement the RA at the Monsanto Kearny Plant. Monsanto directly obtained three of the Certificates of Registration: 1) Remedial Action, 2) Hazardous Waste Generator, and 3) Monitoring Wells; and indirectly obtained the fourth Certificate of Registration through their general contractor (Westinghouse Remediation Services): 4) Discharge Cleanup Organization. Copies of these Certificates of Registration are included as Appendix L.

4.1.4 Project Organization

For the purposes of this RAR, a project organization section has been prepared to discuss the roles and responsibilities of various companies and personnel involved in RA activities. A project organization chart is included as Figure 29. RA activities were performed in accordance with the Department approved RAWP from April 4, 1994 to August 25, 1994.

The role of construction manager and engineer was performed by Roux Associates, Inc. All RA activities from mobilization to demobilization were performed under the supervision of on site Roux Associates, Inc. personnel. In addition to performing construction oversight, Roux Associates, Inc. was responsible for collection of all post-excavation soil samples and compliance monitoring well ground-water samples to assure conformance to quality assurance/quality control (QA/QC) standards discussed in the RAWP. Roux Associates, Inc. subcontracted portions of work to two primary subcontractors: Enseco Inc. of Somerset, New Jersey and EcoChem, Inc. of Seattle, Washington. The roles of each subcontractor included laboratory analysis of all collected samples by Enseco Inc. and validation of data, where necessary, by EcoChem, Inc.

The general contractor retained by Monsanto to implement the RA was Westinghouse Remediation Services, Inc. (WRS) of Montgomeryville, Pennsylvania. WRS was selected as the prime contractor for a number of reasons including previous experiences regarding the

successful remediation of PCB-contaminated soils, a demonstrated understanding of the proposed work, and an exceptional health and safety record. To assist in completion of certain areas of the proposed remediation, WRS retained several specialty subcontractors including steel sheet-piling installation (Barbella Environmental Technology of Whitehouse, New Jersey); dewatering well installation (Moretrench America of Rockaway, New Jersey); laboratory analytical testing of air samples and treated ground-water (Laboratory Resources, Inc. of Bethlehem, Pennsylvania); surveying (GEOD Corp. of New Foundland, New Jersey); asphalt cap installation (Wimpey Minerals USA of Lake Hopatcong, New Jersey); and compaction testing (Mellick-Talley and Associates, Inc. of South Bound Brook, New Jersey).

Hazardous waste transportation and disposal were performed by Chemical Waste Management (CWM) of Princeton, New Jersey under a separate contract with Monsanto. CWM retained several subcontractors to assist with transportation including Horwith Trucking of Northampton, Pennsylvania; Buffalo Fuel Company of Niagara Falls, New York; and Merola Enterprises, Inc. of South Kearny, New Jersey. All hazardous waste was disposed at CWM's TSCA landfill in Model City, New York.

4.1.5 Health and Safety

The following subsections describe the health and safety guidelines and procedures that were followed during RA activities. The subsections include Occupational Safety and Health Administration (OSHA) required training and medical monitoring; health and safety planning; air monitoring; and an Emergency/Contingency Plan that was prepared for RA activities.

4.1.5.1 OSHA Required Training and Medical Monitoring

All field personnel were required to undergo and provide proof of 40-hours of initial training in accordance with OSHA's Hazardous Waste Operation and Emergency Response (HAZWOPER) Standard 29 CFR 1910.120(f)¹⁶ and, when necessary, 8-hour annual refresher training.

Proof that workers were medically fit for duty, as evidenced by a physician's written release stating the worker has undergone medical monitoring and has passed the medical surveillance examination within the last year, was also required for all site workers. Medical monitoring is required of all hazardous waste workers as specified by 29 CFR 1910.120(e).

4.1.5.2 Health and Safety Plan

Roux Associates, Inc. and WRS each prepared a site-specific Health and Safety Plan (HASP) that governed their respective employees and subcontractors. Each HASP was prepared in accordance with the HAZWOPER Standard and OSHA's Guidance Manual for Hazardous Waste Site Activities¹⁷. Additionally, the HASPs incorporated relevant Monsanto Health and Safety guidelines and relevant sections of Chapter 40¹⁸ of the Code of Federal Regulations (CFR) which relate to environmental protection.

All field activities were performed in accordance with all applicable OSHA requirements set forth in OSHA's General Industry Safety and Health Standards (CFR 1910) and OSHA's Construction Industry Safety and Health Standards (CFR 1926).

Of particular importance was OSHA's standard for confined space entry (29 CFR 1910.146) in that entry into each AOC required a confined space entry permit. The Site Health and Safety Officer (SHSO) issued a confined space entry permit only after air monitoring indicated that a potentially hazardous atmosphere did not exist within the confined space (excavation). The following parameters were monitored continuously with direct reading instruments prior to and during any confined space entry:

- Hydrogen sulfide (H₂S);
- Oxygen (O₂);
- Airborne particulates;
- Lower explosive limit (LEL);
- Carbon Monoxide;
- Volatile organic compounds (VOCs); and
- Methane (CH₃)

Additional protocols for confined space entry required that entrants wear a body harness and lifeline to facilitate extraction from the excavation in an emergency. An observer was always present outside of the confined space but positioned such that he was able to maintain continuous visual contact with the entrants. Other provisions for confined space entry included appropriately spaced ladders, back-up level B supplied air respirators, and forced air ventilation.

4.1.5.3 Air Monitoring

In addition to performing air monitoring at the site with direct reading instruments, air samples were periodically submitted for analysis to Laboratory Resources, Inc. of Bethlehem, Pennsylvania. These samples were collected during the initial intrusive activities to determine which compounds and their respective concentrations may be mobilized into the air during construction. This information was then used to develop additional monitoring and health and safety protocols which were followed throughout the course of the RA. A summary of the air monitoring analytical results is included as Table 3. Analytical support documentation for air monitoring sampling is included as Appendix V.

4.1.5.4 Emergency/Contingency Plan

An Emergency/Contingency Plan was prepared in accordance with N.J.A.C. 7:26-9.7(i)¹⁹ as required by the Department's Division of Waste Management. The Emergency/Contingency Plan was prepared for use by local and county fire, police, emergency response and hospital personnel in the event of an emergency while performing RA activities at the Monsanto Kearny Plant.

The Emergency/Contingency Plan was modeled after Resource Conservation and Recovery Act (RCRA) Standards for generators of hazardous wastes as required by the Department. The Emergency/Contingency Plan was designed to be a quick reference document listing key information that would be needed in the event of an emergency such as:

- Facility information, topography and evacuation routes;
- Description and location of wastes;
- Federal, state, and local emergency response contacts;
- Emergency coordinator(s) roles and responsibilities;
- Characteristics and capabilities of safety and emergency response equipment; and
- Identification and location of hospital facilities.

A copy of the Emergency/Contingency Plan which was submitted to the Department and distributed to all local emergency response personnel prior to initiation of RA activities is included as Appendix M.

4.2 Remedial Action Activities

The following subsections discuss, in detail, all activities performed in the field during the course of the RA. RA activities included: mobilization of personnel, equipment and materials; a pre-excavation site survey; installation of construction support facilities and temporary controls; subsurface utility identification, delineation, and removal; surface debris removal; remediation of the AOCs; operation of the water treatment system; soil staging and conditioning; removal of the existing injection trench; surface capping; post-excavation site survey; equipment, material and personnel decontamination; final site restoration; demobilization of personnel, equipment and materials; and progress reporting requirements.

4.2.1 Mobilization of Personnel, Equipment and Materials

All personnel, equipment, and materials necessary to begin RA activities were mobilized to the site on April 4, 1994. The command post, first aid station, and other safety equipment, were among the first pieces of equipment to be mobilized. This equipment remained on site through completion of RA activities. Personnel on site throughout the course of RA activities included representatives from Monsanto, Roux Associates, Inc. and WRS. A full-time WRS Site Health and Safety Officer (SHSO) was among the WRS representatives who remained on site during essentially all field activities from project commencement through project completion.

4.2.2 Pre-Excavation Site Survey

Prior to the commencement of RA activities, a New Jersey-licensed land surveyor was retained by WRS to identify and stake the proposed limits of excavation for each AOC as well as the limits of the asphalt cap. Coordinates for each AOC had been previously surveyed and located in accordance with the approved AOC locations included in the RAWP.

4.2.3 Installation of Construction Support Facilities and Temporary Controls

A number of construction support facilities and temporary controls were installed and maintained during the course of the RA including: a command post and first aid station; site security, temporary fencing and exclusion zone; a contamination reduction zone; temporary utilities; soil erosion and sediment control devices; an equipment decontamination area; a soil handling area; a water treatment system; construction access roads; and dust and odor control and monitoring.

4.2.3.1 Command Post and First Aid Station

The command post and first aid station were located near the exclusion zone entrance on the south side of the site as shown in Figure 28. The command post had electrical service via a power drop from the existing warehouse, and telephone and facsimile lines for safety and convenience. A copy of the HASP, Emergency/Contingency Plan, emergency phone numbers, directions to the nearest hospital, OSHA required signage and all required permits were posted at all times. The command post served as a meeting place for the daily safety meetings and as shelter for personnel during inclement weather. Potable water and sanitary facilities were also be made available to on site personnel. The first aid and eye-wash station conformed to OSHA requirements and were conspicuously labeled and conveniently located should an emergency warrant their need. Sign-in sheets were maintained in the guard house to document the arrival and departure times for all personnel and visitors.

4.2.3.2 Site Security, Temporary Fencing and Exclusion Zone

Site security included utilizing existing chain-link fencing around the site perimeter to keep the public from entering the site, in addition to providing a guard at the front gate during working hours.

In order to provide for the safety and protection of personnel, the work, and visitors entering the exclusion zone, orange high-visibility temporary safety fence was installed and maintained to prevent public entry, and to protect the work and existing facilities from construction operations. The temporary fencing was installed to clearly delineate those areas where access was prohibited or unsafe. At the completion of each work day, the temporary fencing was installed around any open excavations or other hazards and around the entire exclusion zone as shown in Figure 28. The temporary fence was also installed across all entrances and exits to the work zones.

4.2.3.3 Contamination Reduction Zone

A contamination reduction zone (CRZ) was constructed next to the exclusion zone entrance as shown in Figure 28. The CRZ included a personnel decontamination area which consisted of several shallow tubs to collect rinseates generated during personal protective equipment (PPE) decontamination procedures. All rinseates collected in the personnel decontamination area were transported to the water treatment area for subsequent treatment as described in Subsection

4.2.10. The CRZ also served as an area for collection of spent PPE such as Tyvek® coveralls, respirator cartridges, boot covers, and gloves.

4.2.3.4 Temporary Utilities

The following temporary utilities were installed to facilitate construction activities: electricity, telephone; potable water supply; decontamination water, and sanitary facilities. A brief description of the temporary utilities installed is included below:

- Electricity - Temporary electric service was installed from the existing warehouse to the Command Post. Electricity was used for powering tools and equipment required for the performance of the work. The temporary electric service was removed upon completion of RA activities.
- Telephone - Telephone service was installed from the existing warehouse to the Command Post. The telephone service was removed upon completion of RA activities.
- Potable water - A potable water supply was provided for the duration of RA activities via regular deliveries of bottled water to all on site personnel.
- Decontamination water - Potable water required for dust control and decontamination of personnel, equipment and surficial debris removed from the site was provided by Monsanto to the contractor via a public water supply tap located in the office building.
- Sanitary facilities - Two portable chemical toilets were installed and maintained for use by all on site personnel. The toilets were maintained in a neat and orderly condition at all times.

4.2.3.5 Soil Erosion and Sediment Control Devices

Soil erosion and sediment control devices were installed and maintained throughout construction operations. The installation, operation, and maintenance of soil erosion and sediment control devices were in accordance with the current Standards for Soil Erosion and Sediment Control in New Jersey²⁰ and the SESCO as approved by the Hudson-Essex-Passaic Soil Conservation District.

Soil erosion and sediment control devices were installed and maintained to control soil erosion to the maximum extent possible. All soil erosion and sediment control devices were installed and maintained prior to the start of clearing and earthwork operations. Following is a description of some of the soil erosion and sediment control devices that were used.

- All stockpiled soil was covered with an impermeable reinforced tarpaulin to control airborne particulates and to prevent runoff during precipitation events.
- All stockpiled soil was underlain by an impermeable 60-mil HDPE liner and surrounded by a berm to control runoff during precipitation events.
- Silt fencing was installed around the entire area of construction (exclusion zone) and each individual excavation. Silt fencing was installed to prevent migration of contaminated soils resulting from construction activities and the erosional forces of rainwater. Silt fencing was installed as per Hudson-Essex-Passaic Soil Conservation District requirements and Roux Associates, Inc. Bid Package for Remediation of PCB Contaminated Soils²¹.
- Construction access roads exiting the exclusion zone included 50' of crushed stone tracking pad. The tracking pad consisted of 2½-inch crushed stone and spread at least 6" thick. The tracking pad prevented the generation of dust and mud associated with construction vehicle traffic.
- Water sprinkling was used, as necessary, to control the generation of airborne dust associated with construction operations.

4.2.3.6 Equipment Decontamination Area

An equipment decontamination area was designed and installed so that all construction equipment that came in contact with contaminated soil and/or water was able to be decontaminated prior to leaving the site. The equipment decontamination area was designed to form a closed, shallow basin that collected rinse waters (rinseates) during decontamination activities to prevent the spread of contamination outside the equipment decontamination area. The berms and enclosed area were constructed of a 60 mil high density polyethylene (HDPE) which was of sufficient

durability to withstand the loading effects of heavy equipment. The HDPE was underlain with a 16 ounce felt geotextile atop a base of compacted crushed stone.

All equipment, including transportation equipment, that came in contact with contaminated soil and/or water was decontaminated in the equipment decontamination area by brushing, scraping and pressure washing with potable water, to remove any adhering sediments and soil. A sump was installed in a downgradient corner of the equipment decontamination area to facilitate collection and removal of rinseates. All rinseates were transported to the water treatment area for subsequent treatment as described in Subsection 4.2.10. Rinseates were removed from the sump as soon as the sump approached its designed holding capacity. The equipment decontamination area was constructed within the CRZ as shown in Figure 28. Upon completion of RA activities, the HDPE liner and felt geotextile material was disposed at CWM's TSCA landfill in Model City, New York as later discussed in Subsection 4.6.

4.2.3.7 Soil Handling Area

A 60-mil HDPE-lined soil handling area (SHA) measuring 130' by 100' was constructed near the center of the site, as indicated in Figure 28. The HDPE was underlain with a 16 ounce felt geotextile atop a base of compacted crushed stone. A collection trench was constructed along the SHA's northern perimeter and a sump was installed in the northeastern corner of the collection trench to facilitate collection and removal of free liquids for subsequent treatment as discussed in Subsection 4.2.10.

Soil excavated from the APSS and PDA was directly placed on the SHA using a Koehring 6633 track-mounted excavator. When direct placement of excavated soil was not possible, as in the case of the SSP AOC, soil was transported to the SHA using a small dump truck. In addition to being an area to stockpile soil, the SHA was used as an area to drain and condition the soil as necessary. Once on the SHA, the moisture content of the material was adjusted by spreading the soil over a large area with a Komatsu PC-200 track-mounted excavator. Spreading and agitating (tilling) the soil facilitated the evaporation and gravity drainage of moisture. When the moisture content was sufficiently low (when it passed a paint filter test) to be accepted at CWM's TSCA landfill in Model City, New York, the soil was loaded into dump trailers for off site disposal as discussed later in Subsection 4.5.

4.2.3.8 Water Treatment System

A complete water treatment system capable of treating all water generated from dewatering operations, decontamination areas and the soil handling area to a level acceptable for discharge was constructed on the northeastern side of the site as shown in Figure 28. A more detailed description of the water treatment system and its operating procedures are presented as Subsection 4.2.10.

4.2.3.9 Construction Access Roads

Crushed gravel construction access roads were installed where necessary over all unpaved areas of the site to control the generation of dust and mud associated with construction vehicle traffic. Construction access roads were installed to access work areas, staging areas, the SHA, the water treatment system, and other unpaved areas subject to construction vehicle traffic as shown in Figure 28. Restricting construction vehicle traffic to construction access roads, which consisted of imported "clean" (non-contaminated) crushed stone, made it possible to minimize the decontamination process for vehicles exiting the exclusion zone.

Construction access roads leading to and from the exclusion zone also served as "tracking pads" which were installed in accordance with the current Standards for Soil Erosion and Sediment Control in New Jersey and as required by the Hudson-Essex-Passaic Soil Conservation District. The tracking pads were at least 50 feet long, consisted of 2½-inch crushed stone and were spread at least 6 inches thick.

4.2.3.10 Dust and Odor Control and Monitoring

All of the requirements specified in the current Standards for Soil Erosion and Sediment Control in New Jersey related to dust control were complied with during RA activities. Water sprinkling was used to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Airborne particulates were measured with a Miniram PDM-3 aerosol/particulate monitor to verify acceptable particulate levels in the air.

In the event that mitigation of odors emanating from excavations and stockpiled soil was required, odor control devices were available on site throughout construction operations. The odor control system consisted of a compressed air driven Rusmar foam application system. Although available on site, foam was not required to control odors during RA activities.

4.2.4 Subsurface Utility Identification, Delineation, and Removal

Prior to excavation activities, all overhead and underground utilities in the area slated for excavation were identified and delineated. Utilities identification and delineation was accomplished by notifying the Garden State Underground Plant Location Service at least 3 full work days prior to any ground-breaking activities. Monsanto supplied as-builts were also used to aid in utility identification and delineation. Existing utilities in the three AOCs were found to be "out of service" and removal of said utilities to facilitate RA activities was performed.

Removal of existing utilities was performed without event, however, a former gas line that previously fed a boiler located near the PDA, was discovered near an active Public Service Electric and Gas (PSE&G) high pressure gas main. Prior to the removal of the former gas line, a PSE&G engineer was called out on site to assist with the identification, delineation and removal of the former gas line. The line was successfully removed from the area of work without damage to the active main.

All subsurface utility pipelines and conduits that were encountered in the AOCs were removed, transported and disposed at Chemical Waste Management's TSCA landfill in Model City, New York as later described in Section 4.6.

4.2.5 Surface Debris Removal

Excess surface debris encountered within the AOCs or within other areas of the site to be capped included concrete footings and foundations, rock, out of service utilities, railroad ties, and other debris. This debris was removed to a minimum depth corresponding to the bottom elevation of the aggregate base course of the proposed asphalt cap. All concrete was broken up into pieces by hydraulic ram such that they were sized for loading into standard dump trailers. All exposed rebar, mesh, or other reinforcement were cut flush to the surface of each remaining concrete portion. All materials generated during debris removal activities were collected and loaded for transportation to CWM's TSCA landfill in Model City, New York as described in Sections 4.4 and 4.6.

4.2.6 Remediation of SSP Area of Concern

Remediation of the SSP included all construction activities necessary to remediate the AOC in accordance with the approved RAWP. The activities performed included the installation of steel

sheet-piling, dewatering, excavation, post-excavation sampling, data validation, post-excavation surveying, backfilling and compaction. A description of these activities is presented in the following subsections.

4.2.6.1 Installation of Sheet-Piling in SSP

In order to safely and effectively conduct soil removal operations, steel sheet-piling was installed as a vertical barrier around the SSP. The approximate area that was enclosed in the SSP was 21' x 34'. To provide an adequate factor of safety for the proposed 9-foot deep excavation, the steel sheet-piling was installed to a depth of 22 feet below ground surface (BGS).

The steel sheet-piling was designed and installed to form a completely impermeable barrier around the perimeter of the SSP. The sheet-piling isolated the SSP from horizontal groundwater flow to allow for effective dewatering operations necessary for soil excavation activities. The sheeting was left in place following soil removal and backfilling operations to continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within unexcavated soils.

Prior to the installation of the sheeting, detailed engineering design and installation drawings of the proposed sheeting were reviewed. The design calculations were reviewed to ensure that the sheeting could sustain the anticipated external loads created by subsurface soil pressure and hydrostatic pressure due to ground water. Designs for internal bracing (wailer system) that were required to resist combined external loads were also reviewed. As required by OSHA's Excavation and Trenching Standard (29 CFR 1926.650), a Professional Engineer (PE) was required to review and approve the design of any shored excavation in which a worker will enter.

The steel sheet-piling satisfied the requirements of the Standard Specification for Steel Sheet-Piling of the American Society for Testing and Materials, ASTM Designation A328. The sheeting was manufactured by Arbed, Inc. and was certified new "Z"-shape cross-sections of adequate section modulus to resist soil and hydrostatic pressures encountered during construction.

Prior to installation of the steel sheeting, a wailer system consisting of "H" beams was set in place to act as a template during installation. Steel sheeting was driven plumb and tight against the wailer system in a manner to thoroughly support the side of the excavation. Sheeting was driven or vibrated in place utilizing an Ice Model 216 hydraulically operated hammer. Special corner sheets were installed at corners and transition points to ensure continuous water-tight sheeting. As excavation activities progressed, the wailer system was lowered to its design depth to provide additional lateral support.

Upon completion of soil removal and backfilling operations, the steel sheeting was cut to approximately two feet below finished grade and left in place.

4.2.6.2 Dewatering of SSP

Following the installation of the steel sheet-piling in the SSP, dewatering equipment was installed to facilitate soil removal. Information collected during the RI regarding hydraulic conductivity values for the upper and lower water bearing zones were referenced when evaluating the type of dewatering system to be utilized in the SSP.

A Dewatering System Permit was obtained from the Department for all proposed well locations in each AOC prior to installation of the dewatering wells. A copy of the Dewatering System Permit and well record for the SSP is included as Appendix H.

A screened dewatering well designed to dewater the SSP internally to below the proposed depth of the excavation was installed in the southeast corner of the SSP with a Gus Peck bucket auger drill rig. The dewatering well was installed by initially drilling a 24" borehole to a depth of 14'. The dewatering well was constructed using 12" diameter schedule 40 polyvinyl chloride (PVC) casing, 0.050" slotted PVC well screen, and 1/4" pea gravel packing. The well was installed to 14' BGS and was screened from 4' to 14' BGS. All drill cuttings were kept inside the SSP for removal during excavation. Once installation of the dewatering well was completed, a ST-2010B Multiquip submersible pump was installed at the bottom of the well along with 2" flexible discharge hose that carried water to the top of the well. Once out of the well casing, the flexible hose was coupled to 2" PVC piping which ran along the ground surface and ultimately conveyed water to the water treatment system. A description of the water treatment system is provided in Subsection 4.2.10. The submersible pumps were powered by the temporary electric service.

Dewatering operations were initiated prior to soil removal and continued as necessary to maintain hydraulic control during removal operations. All equipment including dewatering wells, submersible pumps, PVC piping and holding tanks were designed to handle a minimum of one hundred and fifty percent of the anticipated flow rate generated during operations. This over design was required for potential emergency dewatering conditions at higher flow rates. Flow rates for dewatering of the SSP, potentially anticipated to be as high as 40 gpm, averaged only 2 to 3 gpm over the course of excavation and backfilling operations due to the effective cut-off created by the sheet-piling. Approximately 20,000 gallons of water were generated during dewatering activities at the SSP. This water was treated for total PCBs and total suspended solids to acceptable levels prior to discharge to an existing injection trench. Post-treatment ground-water analytical results and the total volume of treated water discharged during all RA activities is later discussed in Subsection 4.2.10.

Upon completion of intrusive operations including soil removal and backfilling activities, dewatering equipment was removed from the excavation and decontaminated as discussed in Subsection 4.2.15. Dewatering wells used during the course of the work were abandoned in accordance with current Department requirements. A copy of the SSP Dewatering Well Abandonment Form is included as Appendix I.

4.2.6.3 Excavation of SSP

Prior to initiation of excavation activities in the SSP, the dewatering and water treatment system were started and operated as described in Subsections 4.2.6.2 and 4.2.10, respectively. The excavation was dewatered and maintained such that it was free of water. All sheet-piling was properly supported in accordance with the requirements of OSHA as previously described in Subsection 4.2.6.1.

Excavation was performed in the SSP using Koehring 6633 and Komatsu PC-200 track-mounted excavators. All excavated soil, with the exception of dry surface soil which was direct loaded, was placed in the SHA for subsequent staging and conditioning as described in Subsection 4.2.11. Excavation consisted of the satisfactory removal and disposal of all materials taken from within the limits of the SSP from existing grade to the base of the excavation. The lines and grades to which the SSP was excavated is provided as Plate 1.

The original excavation depth at the SSP was proposed to be to 9' BGS. When the initial excavation was completed, the soil volume removed from the SSP was approximately 285 cubic yards (CY). Following the receipt of an unfavorable post-excavation soil sampling result (see Subsection 4.2.6.4), additional excavation was performed in the SSP to a depth of 10.5' BGS on the southern half of the original excavation. This additional excavation generated an extra 20 CY of soil bringing the SSP total removed soil volume to approximately 305 CY. Final excavation dimensions were checked by on site personnel prior to approval for post-excavation sampling. After receipt of acceptable results from post-excavation sampling, the dimensions of the SSP excavation were confirmed by a New Jersey State-licensed land surveyor. A figure showing the as-built excavated soil volume using the post-excavation survey data has been included as Figure 30.

4.2.6.4 Post-Excavation Soil Sampling and Analysis in SSP

Following excavation to 9' BGS in the SSP, post-excavation soil samples SSP-1 and SSP-2 were collected for both field screening and laboratory analysis. Soil samples were collected in accordance with the approved QAPP found in the RAWP.

Soil samples were collected using individually packaged sterile plastic spoons and pre-cleaned stainless steel mixing bowls. A sufficient sample volume was collected to allow for field screening using immunoassay kits as well as for submission to Enseco, Inc. for laboratory analysis. Prior to soil sample collection, a field blank was collected, for each day of sampling, by pouring laboratory supplied, deionized, analyte free water over field sampling equipment to ensure quality assurance and quality control over sampling and analytical procedures. Field blanks were collected in two 1-liter amber bottles for each field blank.

Field screening was performed on all composite soil samples using Ohmicron Rapid Assay PCB Immunoassay soil kits. Field screening samples were split from collected soil samples to determine approximate concentrations of PCBs and to determine if additional excavation was required beyond the proposed excavation depth. When results from field screening were received and determined to be acceptable, the remaining split soil volume was used for submission to Enseco, Inc.

Post-excavation soil samples were placed in laboratory supplied, 250 ml wide mouth glass containers. Soils were compacted in jars and capped to eliminate free air space. Each sample was then labeled with sample date and time, sample designation, site location, sample method and sampler initials. Samples were then enclosed in resealable plastic bags and placed on ice in an insulated cooler. Chain of custody (COC) forms were completed for each day of sampling and included the client's name, site location, sample designation, time and date of collection, method of analysis, preservation, and method of delivery. The COC was then signed to document that samples were relinquished by the field sampler. Samples were documented as being received by employees of Impulse Courier services and delivered to Enseco, Inc. where analysis of the samples was performed. All samples including field blanks were analyzed in accordance with USEPA Method 8080 for PCBs.

The analytical results of post-excavation soil sample SSP-2 showed an exceedance of the subsurface cleanup level of 100 mg/kg for total PCBs. The results of the two composite samples SSP-1 and SSP-2 were 33 mg/kg and 1,100 mg/kg, respectively. Due to the exceedance in SSP-2, additional excavation on the southern half of the excavation was performed. After an additional 20 CY of soil was excavated, a second round of soil sampling was conducted in accordance with the methods previously described. The designation of the second round composite sample location was SSP-2a. The analytical results for SSP-2a was 6.6 ppm total PCBs, which allowed for commencement of the post-excavation survey and backfilling. A summary of all SSP post-excavation soil sampling results is included as Table 4. The SSP post-excavation sampling locations have been provided as Figure 31. Analytical support documentation for post-excavation soil samples in the SSP are included as Appendix W.

4.2.6.5 Data Validation of SSP Soil Samples

Following the collection of each post-excavation soil sampling round from the SSP, the sample results were validated by an independent data validation firm, EcoChem, Inc. of Seattle, Washington. EcoChem, Inc. was contracted to perform a full laboratory audit of the analytical laboratory's (Enseco, Inc.) methods, protocols and procedures for analysis of soil samples by USEPA Method 8080. In the case of the SSP, EcoChem, Inc. was present at the laboratory during the extraction and analysis of sample data. Within 48 hours of sample collection, Roux Associates, Inc. received post-excavation soil sampling analytical data from the laboratory that had been signed off by the quality control (QC) director from the laboratory as well as being

fully validated by EcoChem, Inc. This method of data evaluation enabled Monsanto to have the highest level of confidence in the data prior to authorizing backfilling operations later described in Subsection 4.2.6.7. A copy of the complete data validation report is included as Appendix N.

4.2.6.6 Post-Excavation Survey of SSP

Upon receipt of acceptable and fully validated post-excavation soil sampling analytical results indicating that total PCBs were less than the subsurface soil criteria of 100 mg/kg, the SSP was surveyed by a New Jersey-licensed land surveyor to document the as-built depth of the excavation. The results of this post-excavation survey is presented along with the other AOCs in Plate 1.

4.2.6.7 Backfilling and Compaction of SSP

Before any backfill materials were brought on site, a letter of certification stating that all backfill materials proposed for use were free of contaminants was provided by the quarry, as required in N.J.A.C. 7:26E-6.4(b)2. These certificates of clean backfill are included in Appendix O. The backfill was required to be free of hazardous substances or waste materials as defined by the Resource Conservation and Recovery Act (RCRA) Section 3010 and codified as 40 CFR Part 261 as amended, and satisfy all requirements for such use as established by the Department.

Following the completion of the post-excavation survey, the SSP was backfilled to original grade with certified clean fill. The clean fill was placed using a Komatsu PC-150 track-mounted excavator and then graded both by hand and excavator in accordance with NJDOT Standard Specifications Section 203. Clean fill was placed and compacted in 12-inch lifts for the first five feet of backfill and 6-inch lifts for the next four feet of backfill. Compaction of lifts was achieved with a Wacker plate compactor and Wacker double drum roller. Following installation and compaction of the imported clean fill, each lift was compaction tested with a Troxler 3411B Nuclear Density Gauge. Density tests were performed at a frequency of 4 tests per lift for each 12-inch lift and 2 tests per lift for each 6-inch lift. All tests were in excess of 95% of the ASTM D-698 maximum dry density (Standard Proctor). Copies of the backfill compaction results are included as Appendix P.

4.2.7 Remediation of APSS Area of Concern

Remediation of the APSS included all construction activities necessary to remediate the AOC in accordance with the approved RAWP. The activities performed included the installation of steel sheet-piling, dewatering, excavation, post-excavation sampling, data validation, post-excavation surveying, backfilling and compaction. A description of these activities is presented in the following subsections.

4.2.7.1 Installation of Sheet-Piling in APSS

In order to safely and effectively conduct soil removal operations, steel sheet-piling was also installed as a vertical barrier around the APSS. The approximate area that was enclosed in the APSS was 40' x 53'. To provide an adequate factor of safety for the proposed 9-foot deep excavation, the steel sheet-piling was installed to a depth of 22 feet BGS.

The steel sheet-piling was designed and installed to form a completely impermeable barrier around the perimeter of the APSS. The sheet-piling isolated the APSS from horizontal groundwater flow to allow for effective dewatering operations necessary for soil excavation activities. The sheeting was left in place following soil removal and backfilling operations to continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within unexcavated soils.

Prior to the installation of the sheeting, detailed engineering design and installation drawings of the proposed sheeting were reviewed. The design calculations were reviewed to ensure that the sheeting could sustain the anticipated external loads created by subsurface soil pressure and hydrostatic pressure due to ground water. Designs for internal bracing (wailer system) that were required to resist combined external loads were also reviewed. As required by OSHA's Excavation and Trenching Standard (29 CFR 1926.650), a Professional Engineer (PE) was required to review and approve the design of any shored excavation in which a worker will enter.

The steel sheet-piling satisfied the requirements of the Standard Specification for Steel Sheet-Piling of the American Society for Testing and Materials, ASTM Designation A328. The sheeting was manufactured by Arbed, Inc. and was certified new "Z"-shape cross-sections of

adequate section modulus to resist soil and hydrostatic pressures encountered during construction.

Prior to installation of the steel sheeting, a wailer system consisting of "H" beams was set in place to act as a template during installation. Steel sheeting was driven plumb and tight against the wailer system in a manner to thoroughly support the side of the excavation. Sheeting was driven or vibrated in place utilizing an Ice Model 216 hydraulically operated hammer. Special corner sheets were installed at corners and transition points to ensure continuous water-tight sheeting. As excavation activities progressed, the wailer system was lowered to its design depth to provide additional lateral support.

Upon completion of soil removal and backfilling operations, the steel sheeting was cut to two feet below finished grade and left in place.

4.2.7.2 Dewatering of APSS

Following the installation of the steel sheet-piling in the APSS, dewatering equipment was installed to facilitate soil removal. Information collected during the RI regarding hydraulic conductivity values for the upper and lower water bearing zones were referenced when evaluating the type of dewatering system to be utilized in the APSS.

The dewatering system wells installed were screened dewatering wells designed to dewater the APSS internally to below the proposed depth of the excavation. These wells were installed in the southwest and northeast corners of the APSS with a Gus Peck bucket auger drill rig. The dewatering wells were installed by initially drilling 24" boreholes to a depth of 14' and 15' BGS, respectfully. The dewatering wells were then constructed using 12" diameter schedule 40 PVC casing, 0.050" slotted PVC well screen, and ¼" pea gravel packing. The wells were installed from existing grade to 14' BGS and 15' BGS, respectively, and were screened from 4' to 14' BGS and 5' to 15' BGS, respectively. All drill cuttings were kept inside the APSS for removal during excavation. Once installation of the dewatering wells was completed, ST-2010B Multiquip submersible pumps were installed at the bottom of each well with 2" flexible hoses that carried water to the top of each well. Once out of the casing, the flexible hoses were coupled to 2" PVC piping which ran along the ground surface and ultimately conveyed water

to the water treatment system. A description of the water treatment system is provided in Subsection 4.2.10. The submersible pumps were powered by the temporary electric service.

Dewatering operations were initiated prior to soil removal and were continued as necessary to maintain hydraulic control during removal operations. All equipment including dewatering wells, submersible pumps, PVC piping and holding tanks were designed to handle a minimum of one hundred and fifty percent of the anticipated flow rate generated during operations. This over design was required for potential emergency dewatering conditions at higher flow rates. Flow rates for dewatering of the APSS, anticipated to be as high as 40 gpm, also averaged only 2 to 3 gpm over the course of excavation and backfilling operations. Approximately 40,000 gallons of water were generated during dewatering activities at the APSS. This water was treated for total PCBs and total suspended solids to acceptable levels prior to discharge to an existing injection trench. Post-treatment ground-water analytical results and the total volume of treated water discharged during all RA activities is further discussed in Subsection 4.2.10.

Upon completion of intrusive operations including soil removal and backfilling activities , all dewatering equipment was removed from the excavation and decontaminated as discussed in Subsection 4.2.15. Dewatering wells used during the course of the work were abandoned in accordance with current Department requirements. A copy of the APSS Dewatering Well Abandonment Forms are included in Appendix I.

4.2.7.3 Excavation of APSS

Prior to initiation of excavation activities in the APSS, the dewatering and water treatment systems were started and operated as described in Subsections 4.2.7.2 and 4.2.10, respectively. The excavation was dewatered and maintained such that it was free of water. All sheet-piling was properly supported in accordance with the requirements of OSHA as previously described in Subsection 4.2.6.1.

Excavation was performed in the APSS using a Koehring 6633 track-mounted excavator. All excavated soil, with the exception of dry surface soil which was direct loaded, was placed in the SHA for subsequent staging and conditioning as described in Subsection 4.2.11.

Excavation consisted of the satisfactory removal and disposal of all materials taken from within the limits of the APSS from existing grade to the base of the excavation. The lines and grades to which the APSS was excavated are provided in Plate 1. The excavation of the APSS was continued to 9' BGS. When the excavation was completed, the total soil volume removed from the APSS was approximately 806 CY. Final excavation dimensions were checked by on site personnel prior to approval for post-excavation soil sampling. After receipt of acceptable results from post-excavation sampling, the dimensions of the APSS excavation were confirmed by a New Jersey State-licensed land surveyor. A figure showing the as-built excavated soil volume using the post-excavation survey data has been included as Figure 32.

4.2.7.4 Post-Excavation Soil Sampling and Analysis in APSS

Following excavation to 9' BGS in the APSS, post-excavation soil samples APSS-1, APSS-2 and APSS-3 were collected for both field screening and laboratory analysis. Soil samples were collected in accordance with the approved QAPP found in the RAWP and as previously described in Section 4.2.6.4. Prior to submission for laboratory analysis, field screening was performed on all composite soil samples using Ohmicron Rapid Assay PCB Immunoassay soil kits. Field screening samples were taken from spilt post-excavation samples to evaluate approximate concentrations of PCBs at depth and to determine if additional excavation beyond 9' BGS was required. Upon obtaining favorable field screening results, the remaining split sample volumes were submitted for laboratory analysis.

All post-excavation samples collected at the APSS met the subsurface compliance criteria of less than 100 mg/kg total PCBs. Sample results ranged from a low of 11 mg/kg in APSS-3 to a high of 14 mg/kg in APSS-2. A summary of the post-excavation soil sample results for APSS-1, APSS-2 and APSS-3 is provided in Table 5. The APSS post-excavation sampling locations have been provided as Figure 33. Analytical support documentation for post-excavation samples in the APSS is included as Appendix W.

4.2.7.5 Data Validation of APSS Soil Samples

Following the collection of post-excavation soil samples from the APSS, the sample results were also validated by an independent data validation firm, EcoChem, Inc. of Seattle, Washington. Within 48 hours of sample collection, Roux Associates, Inc. received post-excavation soil sampling analytical data from the laboratory that had been signed off by the quality control (QC)

director from the laboratory as well as being fully validated by EcoChem, Inc. This method of data evaluation enabled Monsanto to have the highest level of confidence in the data prior to authorizing backfilling operations later described in Subsection 4.2.7.7. A copy of the complete data validation report is included as Appendix N.

4.2.7.6 Post-Excavation Survey of APSS

Upon receipt of acceptable and fully validated post-excavation soil sampling analytical results indicating that total PCBs were less than the subsurface soil criteria of 100 mg/kg, the APSS was surveyed by a New Jersey-licensed land surveyor to document the as-built depth of the excavation. The results of this post-excavation survey is presented along with the other AOCs in Plate 1.

4.2.7.7 Backfilling and Compaction of APSS

Before any backfill materials were brought on site, a letter of certification stating that all backfill materials proposed for use were free of contaminants was provided by the quarry, as required in N.J.A.C. 7:26E-6.4(b)2. These certificates of clean backfill are included in Appendix O. The backfill was required to be free of hazardous substances or waste materials as defined by the Resource Conservation and Recovery Act (RCRA) Section 3010 and codified as 40 CFR Part 261 as amended, and satisfy all requirements for such use as established by the Department.

Following the completion of the post-excavation survey, the APSS was backfilled to original grade with certified clean fill. The clean fill was dumped directly into the APSS using dump trailers and then graded both by hand and with a Komatsu D21E bulldozer. The clean fill was placed and compacted in 12-inch lifts for the first five feet of backfill and 6-inch lifts for the next four feet of backfill. Compaction of lifts was achieved with a Wacker plate compactor and Wacker double drum roller. Following installation and compaction of the imported clean fill, each lift was compaction tested with a Troxler 3411B Nuclear Density Gauge. Density tests were performed at a frequency of 4 tests per lift for each 12-inch lift and 2 tests per lift for each 6-inch lift. All tests were in excess of 95% of the maximum dry density of the material as determined by ASTM D-698 (Standard Proctor). Copies of the backfill compaction results are included as Appendix P.

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4.2.8 Remediation of Inner PDA Area of Concern

Remediation of the inner PDA included all construction activities necessary to remediate the AOC in accordance with the approved RAWP. The activities performed included the installation of steel sheet-piling, dewatering, excavation, post-excavation sampling, data validation, post-excavation surveying, backfilling and compaction. A description of these activities are presented in the following subsections.

4.2.8.1 Installation of Sheet-Piling in Inner PDA

In order to safely and effectively conduct soil removal operations, steel sheet-piling was also installed as a vertical barrier around the inner PDA. The approximate area that was enclosed in the inner PDA was 47' x 36'. To provide an adequate factor of safety for the proposed 24-foot deep excavation, the steel sheet-piling was installed to a depth of 35' BGS.

The steel sheet-piling was designed and installed to form a complete impermeable barrier around the perimeter of the inner PDA. The sheet-piling isolated the inner PDA from horizontal ground-water flow to allow for effective dewatering operations necessary for soil excavation activities. The sheeting was left in place following soil removal and backfilling operations to continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within unexcavated soils.

Prior to the installation of the sheeting, detailed engineering design and installation drawings of the proposed sheeting were reviewed. The design calculations were reviewed to ensure that the sheeting could sustain the anticipated external loads created by subsurface soil pressure and hydrostatic pressure due to ground water. Designs for internal bracing (wailer system) that were required to resist combined external loads were also reviewed. As required by OSHA's Excavation and Trenching Standard (29 CFR 1926.650), a Professional Engineer (PE) was required to review and approve the design of any shored excavation in which a worker will enter.

The steel sheet-piling satisfied the requirements of the Standard Specification for Steel Sheet-Piling of the American Society for Testing and Materials, ASTM Designation A328. The sheeting was manufactured by Arbed, Inc. and was certified new "Z"-shape cross-sections of

adequate section modulus to resist soil and hydrostatic pressures encountered during construction.

Prior to installation of the steel sheeting, a wailer system consisting of "H" beams was set in place to act as a template during installation. Steel sheeting was driven plumb and tight against the wailer system in a manner to thoroughly support the side of the excavation. Sheeting was driven or vibrated in place utilizing an Ice Model 216 hydraulically operated hammer. Special corner sheets were installed at corners and transition points to ensure continuous water-tight sheeting. As excavation activities progressed, the wailer system was lowered to its design depth to provide additional lateral support.

Upon completion of soil removal and backfilling operations, the steel sheeting was cut to two feet below finished grade and left in place.

4.2.8.2 Dewatering of Inner PDA

Following the installation of the steel sheet-piling in the inner PDA, dewatering equipment was installed to facilitate soil removal. Information collected during the RI regarding hydraulic conductivity values for the upper and lower water bearing zones were referenced when evaluating the type of dewatering system to be utilized in the inner PDA.

The dewatering system well installed was a screened dewatering well designed to dewater the inner PDA internally to below the proposed depth of the excavation. This well was installed in the northeast corner of the inner PDA with a Gus Peck bucket auger drill rig. The dewatering well was installed by initially drilling a 24" borehole to a depth of 30' BGS. The dewatering well was then constructed using 12" diameter schedule 40 PVC casing, 0.050" slotted PVC well screen, and ¼" pea gravel packing. The well was installed from existing grade to 30' BGS and was screened from 20' to 30' BGS. All drill cuttings were kept inside the inner PDA for removal during excavation. Once installation of the dewatering well was completed, a ST-2010B Multiquip submersible pump was installed at the bottom of the well with a 2" flexible hose that carried water to the top of the well. Once out of the casing, the flexible hose was coupled to 2" PVC piping which ran along the ground surface and ultimately conveyed water to the water treatment system. A description of the water treatment system is provided in Subsection 4.2.10. The submersible pumps were powered by the temporary electric service.

Dewatering operations were initiated prior to soil removal and were continued as necessary to maintain hydraulic control during removal operations. All equipment including dewatering wells, submersible pumps, PVC piping and holding tanks were designed to handle a minimum of one hundred and fifty percent of the anticipated flow rate generated during operations. This over design was required for potential emergency dewatering conditions at higher flow rates. Flow rates for dewatering of inner PDA, anticipated to be as high as 40 gpm, averaged 3 gpm over the course of excavation and backfilling operations. Approximately 85,000 gallons of water were generated during dewatering activities at the inner PDA. This water was treated for total PCBs and total suspended solids to acceptable levels prior to discharge to an existing injection trench. Post-treatment ground-water analytical results and total volume of treated water discharged during all RA activities is further discussed in Subsection 4.2.10.

Upon completion of intrusive operations including soil removal and backfilling activities, all dewatering equipment was removed from each excavation and decontaminated as discussed in Subsection 4.2.15. Dewatering wells used during the course of the work shall be abandoned in accordance with current Department requirements. A copy of the inner PDA Dewatering Well Abandonment Form is included in Appendix I.

4.2.8.3 Excavation of Inner PDA

Prior to initiation of excavation activities, a dewatering and water treatment system was installed and operated as described in Subsections 4.2.8.2 and 4.2.10, respectively. The excavation was dewatered and maintained such that it was free of water. All sheet-piling was properly supported in accordance with the requirements of OSHA as previously described in Subsection 4.2.6.1.

Excavation was performed in the inner PDA using Koehring 6633, Caterpillar 235, and Kubota KG-60 track-mounted excavators. All excavated soil, with the exception of dry surface soil which was direct loaded, was placed in the SHA for subsequent staging and conditioning as described in Subsection 4.2.11.

Excavation consisted of the satisfactory removal and disposal of all materials taken from within the limits of the inner PDA from existing grade to the base of the excavation. The lines and grades to which the inner PDA was excavated are provided in Plate 1. The excavation of the

inner PDA was continued to 24' BGS. When the excavation was completed, the total soil volume removed from the inner PDA was approximately 1,718 CY. Final excavation dimensions were checked by on site personnel prior to approval for post-excavation soil sampling. After receipt of acceptable results from post-excavation sampling, the dimensions of the inner PDA excavation were confirmed by a New Jersey State-licensed land surveyor. A figure showing the as-built excavated soil volume using the post-excavation survey data has been included as Figure 34.

4.2.8.4 Post-Excavation Soil Sampling and Analysis in Inner PDA

Following excavation to 24' BGS in the inner PDA, post-excavation soil samples IPDA-1 and IPDA-2 were collected for both field screening and laboratory analysis. Soil samples were collected in accordance with the approved QAPP found in the RAWP and as previously described in Section 4.2.6.4. Prior to submission for laboratory analysis, field screening was performed on all composite soil samples using Ohmicron Rapid Assay PCB Immunoassay soil kits. Field screening samples were taken from split post-excavation samples to evaluate approximate concentrations of PCBs at depth and to determine if additional excavation beyond 24' BGS was required. Upon obtaining favorable field screening results, the split sample volumes were submitted for laboratory analysis.

All post-excavation samples collected at the inner PDA met the subsurface compliance criteria of 100 mg/kg total PCBs. The results for both samples were non-detectable. A summary of the post-excavation soil sample results for IPDA-1 and IPDA-2 is provided in Table 6. The inner PDA post-excavation sampling locations have been provided as Figure 35. Analytical support documentation of post-excavation soil samples in the inner PDA is included as Appendix W.

4.2.8.5 Data Validation of Inner PDA Soil Samples

Following the collection of post-excavation soil samples from the inner PDA, the sample results were validated by an independent data validation firm, EcoChem, Inc. of Seattle, Washington. Within 48 hours of sample collection, Roux Associates, Inc. received post-excavation soil sampling analytical data from the laboratory that had been signed off by the quality control (QC) director from the laboratory as well as being fully validated by EcoChem, Inc. This method of data evaluation enabled Monsanto to have the highest level of confidence in the data prior to

authorizing backfilling operations later described in Subsection 4.2.8.7. A copy of the complete data validation report is included as Appendix N.

4.2.8.6 Post-Excavation Survey of Inner PDA

Upon receipt of acceptable and fully validated post-excavation soil sampling analytical results indicating that total PCBs were less than the subsurface soil criteria of 100 mg/kg, the inner PDA was surveyed by a New Jersey-licensed land surveyor to document the as-built depth of the excavation. The results of this post-excavation survey is presented along with the other AOCs in Plate 1.

4.2.8.7 Backfilling and Compaction of Inner PDA

Before any backfill materials were brought on site, a letter of certification stating that all backfill materials proposed for use were free of contaminants was provided by the quarry, as required in N.J.A.C. 7:26E-6.4 (b)2. These certificates of clean backfill are included in Appendix O. The backfill was required to be free of hazardous substances or waste materials as defined by the Resource Conservation and Recovery Act (RCRA) Section 3010 and codified as 40 CFR Part 261 as amended, and satisfy all requirements for such use as established by the Department.

Following the completion of the post-excavation survey, the inner PDA was backfilled to original grade with NJDOT No. 2 crushed stone, a soil/bentonite layer, and certified clean fill as shown on Plate 1. A seven foot layer of NJDOT No. 2 crushed stone was dumped directly into the excavation from dump trucks and then graded both by hand and with a Komatsu D-21E bulldozer. The next layer of backfill installed, as shown on Plate 1, was a soil/bentonite layer to replace the existing peat layer. After installation of the soil/bentonite layer (discussed in Section 4.2.8.8) in 12-inch lifts, clean fill was placed and compacted in 12-inch lifts for the first five feet of backfill and 6-inch lifts for the next four feet of backfill. Compaction of lifts was achieved with a Wacker plate compactor and Wacker double drum roller. After installation and compaction of the individual lifts was completed, each lift was compaction tested with a Troxler 3411B Nuclear Density Gauge. Density tests were performed at a frequency of 4 tests per lift per 12-inch lift and 2 tests per lift for each 6-inch lift. All tests were in excess of 95% of the ASTM D - 698 maximum dry density (Standard Proctor). Copies of the backfill compaction logs are presented as Appendix P.

4.2.8.8 Installation of the Soil/Bentonite Layer

In order to simulate the semi-confining properties of the natural peat layer, a soil/bentonite mixture was backfilled into the inner PDA at the approximate depths shown on Plate 1. The mixture installed consisted of a 5-foot thick sodium bentonite tilled soil layer compacted to 90% Standard Proctor. The soil layer was completely and uniformly tilled with polymerized contaminant resistant sodium bentonite (Cetco SS-100) at a mixing rate of 5 pounds per cubic foot to yield a permeability of 10^{-7} centimeters per second (cm/sec). The soil used for this mix was certified as clean (free from pollutants). A certificate of clean backfill is attached as Appendix O.

The soil/bentonite layer was placed in 12-inch lifts and compacted to a minimum of 90% Standard Proctor. Compaction was achieved using a Wacker plate tamper and Wacker double drum roller. The soil/bentonite mix density and moisture measurements were monitored with a minimum of four nuclear density measurements per 12-inch lift. A geotextile material was placed beneath and atop the soil/bentonite layer.

4.2.9 Remediation of Outer PDA Area of Concern

Remediation of the outer PDA included all construction activities necessary to remediate the AOC in accordance with the approved RAWP. The activities performed included the installation of steel sheet-piling, dewatering, excavation, post-excavation sampling, data validation, post-excavation surveying, backfilling and compaction. A description of these activities are presented in the following subsections.

4.2.9.1 Installation of Sheet-Piling in Outer PDA

In order to safely and effectively conduct soil removal operations, steel sheet-piling was also installed as a vertical barrier around the outer PDA. The approximate area that was enclosed in the outer PDA was 67' x 80'. To provide an adequate factor of safety for the proposed 9-foot deep excavation, steel sheet-piling was installed to a depth of 22 BGS.

The steel sheet-piling was designed and installed to form a complete impermeable barrier around the perimeter of the outer PDA. The sheet-piling isolated the outer PDA from horizontal ground-water flow to allow for effective dewatering operations necessary for soil excavation activities. The sheeting was left in place following soil removal and backfilling operations to

continue to act as an engineering control in prevention of contaminant migration for those contaminants currently bound within unexcavated soils.

Prior to the installation of the sheeting, detailed engineering design and installation drawings of the proposed sheeting were reviewed. The design calculations were reviewed to ensure that the sheeting could sustain the anticipated external loads created by subsurface soil pressure and hydrostatic pressure due to ground water. Designs for internal bracing (wailer system) that were required to resist combined external loads were also reviewed. As required by OSHA's Excavation and Trenching Standard (29 CFR 1926.650), a Professional Engineer (PE) was required to review and approve the design of any shored excavation in which a worker will enter.

The steel sheet-piling satisfied the requirements of the Standard Specification for Steel Sheet-Piling of the American Society for Testing and Materials, ASTM Designation A328. The sheeting was manufactured by Arbed, Inc. and was certified new "Z"-shape cross-sections of adequate section modulus to resist soil and hydrostatic pressures encountered during construction.

Prior to installation of the steel sheeting, a wailer system consisting of "H" beams was set in place to act as a template during installation and later add additional support. Steel sheeting was driven plumb and tight against the wailer system in a manner to thoroughly support the side of the excavation. Sheeting was driven or vibrated in place utilizing an Ice Model 216 hydraulically operated hammer. Special corner sheets were installed at corners and transition points to ensure continuous water-tight sheeting. As excavation activities progressed, the wailer system was lowered to its design depth to provide additional lateral support.

Upon completion of soil removal and backfilling operations, the steel sheeting was cut to two feet below finished grade and left in place.

4.2.9.2 Dewatering of Outer PDA

Following the installation of the steel sheet-piling in the outer PDA, dewatering equipment was installed to facilitate soil removal. Information collected during the RI regarding hydraulic

conductivity values for the upper and lower water bearing zones were referenced when evaluating the type of dewatering system to be utilized in the outer PDA.

The dewatering wells installed were designed to dewater the outer PDA internally to below the proposed depth of the excavation. These wells were located in the northeast and southwest corners of the outer PDA. The wells were installed by initially drilling 24" boreholes to depths of 13' and 14' BGS, respectively. The dewatering wells were then constructed using 12" diameter schedule 40 PVC casing, 0.050 slotted PVC well screen, and ¼" pea gravel packing. The wells were installed from existing grade to 13' BGS and 14' BGS and were screened from 3' to 13' BGS and 4' to 14' BGS, respectively. All drill cuttings were kept inside the outer PDA for removal during excavation. Once installation of the dewatering wells was completed, a ST-2010B Multiquip submersible pump was installed at the bottom of each well with a 2-inch flexible hose that conveyed water to the top of each well. Once out of the casing, the flexible hose was coupled to 2-inch PVC piping which ran along the ground surface and ultimately conveyed water to the water treatment system. A description of the water treatment system is provided in Subsection 4.2.10. The submersible pumps were powered by the temporary electric service.

Dewatering operations were initiated prior to soil removal and were continued as necessary to maintain hydraulic control during removal operations. All equipment including dewatering wells, submersible pumps, PVC piping and holding tanks were designed to handle a minimum of one hundred and fifty percent of the anticipated flow rate generated during operations. This over design was required for potential emergency dewatering conditions at higher flow rates. Flow rates for dewatering of the outer PDA, anticipated to be as high as 40 gpm, averaged 2 to 3 gpm over the course of excavation and backfilling operations. Approximately 69,500 gallons of water were generated during dewatering activities of the outer PDA. This water was treated for total PCBs and total suspended solids to acceptable levels prior to discharge to an existing injection trench. Post-treatment ground-water analytical results and the total volume of treated water discharged during all RA activities is further discussed in Subsection 4.2.10.

Upon completion of intrusive operations including soil removal and backfilling activities, all dewatering equipment was removed from each excavation and decontaminated as discussed in Subsection 4.2.15. Dewatering wells used during the course of the work were abandoned in

accordance with current Department requirements. A copy of the outer PDA Dewatering Well Abandonment Forms are included in Appendix I.

4.2.9.3 Excavation of Outer PDA

Prior to initiation of excavation activities, a dewatering and water treatment system was installed and operated as described in Subsections 4.2.9.2 and 4.2.10, respectively. The excavation was dewatered and maintained such that it was free of water. All sheet-piling was properly supported in accordance with the requirements of OSHA as previously described in Subsection 4.2.6.1.

Excavation was performed in the outer PDA using Koehring 6633 Caterpillar 235, and Kubota KH-60 track-mounted excavators. All excavated soil, with the exception of dry surface soil which was direct loaded, was placed in the SHA for subsequent staging and conditioning as described in Subsection 4.2.11.

Excavation consisted of the satisfactory removal and disposal of all materials taken from within the limits of the outer PDA from existing grade to the base of the excavation. The lines and grades to which the outer PDA was excavated are provided in Plate 1. The excavation of the outer PDA was continued to 9' BGS. When the excavation was completed, the total soil volume removed from the outer PDA was approximately 1,157 CY. Final excavation dimensions were checked by on site personnel prior to approval for post-excavation soil sampling. After receipt of acceptable results from post-excavation sampling, the dimensions of the outer PDA excavation were confirmed by a New Jersey State-licensed land surveyor. A figure showing the as-built excavated soil volume using the post-excavation survey data has been included as Figure 34.

4.2.9.4 Post-Excavation Soil Sampling and Analysis in Outer PDA

Following excavation to 9' BGS in the outer PDA, post-excavation soil samples OPDA-1, OPDA-2, OPDA-3, and OPDA-4 were collected for both field screening and laboratory analysis. Soil samples were collected in accordance with the approved QAPP found in the RAWP and as previously described in Subsection 4.2.6.4. Prior to submission for laboratory analysis, field screening was performed on all composite soil samples using Ohmicron Rapid Assay PCB Immunoassay soil kits. Field screening samples were taken from split post-excavation samples to evaluate approximate concentrations of PCBs at depth and to determine if additional

excavation beyond 24' BGS was required. Upon obtaining favorable field screening results, the split sample volumes were submitted for laboratory analysis. All post-excavation samples collected at the outer PDA met the subsurface compliance criteria of less than 100 mg/kg total PCBs. The results ranged from a low of 1.9 mg/kg in sample OPDA-1 to a high of 51 mg/kg in sample OPDA-2. A summary of the post-excavation soil sample results for OPDA-1, OPDA-2, OPDA-3, and OPDA-4 are provided in Table 7. The outer PDA post-excavation sampling locations have been provided as Figure 36. Analytical support documentation for post-excavation soil samples in the outer PDA is included as Appendix W.

4.2.9.5 Data Validation of Outer PDA Soil Samples

Following the collection of post-excavation soil samples from the outer PDA, the sample results were validated by an independent data validation firm, EcoChem, Inc. of Seattle, Washington. Within 48 hours of sample collection, Roux Associates, Inc. received post-excavation soil sampling analytical data from the laboratory that had been signed off by the quality control (QC) director from the laboratory as well as being fully validated by EcoChem, Inc. This method of data evaluation enabled Monsanto to have the highest level of confidence in the data prior to authorizing backfilling operations later described in Subsection 4.2.9.7. A copy of the complete data validation report is included as Appendix N.

4.2.9.6 Post-Excavation Survey of Outer PDA

Upon receipt of acceptable and fully validated post-excavation soil sampling analytical results indicating that total PCBs were less than the subsurface soil criteria of 100 mg/kg, the outer PDA was surveyed by a New Jersey-licensed land surveyor to document the as-built depth of the excavation. The results of this post-excavation survey is presented along with the other AOCs in Plate 1.

4.2.9.7 Backfilling and Compaction of Outer PDA

Before any backfill materials were brought on site, a letter of certification stating that all backfill materials proposed for use were free of contaminants was provided by the quarry, as required in N.J.A.C. 7:26E-6.4(b)2. These certificates of clean backfill are included in Appendix O. All backfill materials were placed in accordance with NJDOT Standard Specifications Section 203. The backfill was required to be free of hazardous substances or waste materials as defined

by RCRA Section 3010 and codified as 40 CFR Part 261 as amended, and satisfy all requirements for such use as established by the Department.

Following the completion of the post-excavation survey, the outer PDA was backfilled to original grade with certified clean fill. The clean fill was dumped directly into the excavation from dump trucks and then graded both by hand and with a Komatsu D21E bulldozer. Clean fill was placed and compacted in 12" lifts for the first five feet of backfill and 6-inch lifts for the next four feet of backfill. Compaction of lifts was achieved with a Wacker plate compactor and Wacker double drum roller. After installation and compaction of individual lifts was completed, they were compaction tested with a Troxler 3411B Nuclear Density Gauge. Density tests were performed at a frequency of 4 tests per lift for each 12" lift and 2 tests per lift for each 6-inch lift. All tests were in excess of 95% of the ASTM D-698 maximum dry density (Standard Proctor). Copies of backfill compaction logs are presented as Appendix P.

4.2.10 Operation of Water Treatment System

All rinseates/water generated from dewatering operations, decontamination areas, and the SHA was transferred via pumping equipment to the water treatment system. The water treatment system consisted of several components which were all staged within a bermed area that was lined with an impermeable liner. The first component of the water treatment system was a 21,000-gallon primary clarifier. The primary clarifier consisted of a closed-top style baffled Baker tank with access ports from the top to allow for visual inspection of influent flow conditions. A free product removal system was installed in the primary clarifier as required by the Department, in the event that free product was encountered during dewatering operations. The free product removal system consisted of an Oil Recovery Systems (ORS) Filter Scavenger pump skimming system complete with product discharge lines and a recovery drum. Although free product had been found during previous investigations, no free product was recovered during dewatering activities.

The function of the primary clarifier was to facilitate suspended solids removal. Solids removal was critical insomuch that the primary reason for treating ground water at this site was for trace PCBs dissolved in ground water and adsorbed onto suspended solids. All settled solids in the primary clarifier were later removed and placed on the SHA upon decontamination of the water

treatment system. The solids were then transported to CWM's TSCA landfill in Model City, New York.

The primary clarifier effluent was fed into two Harmsco, Inc. Model HIF-BBHP bag filters set up in parallel to remove any remaining suspended solids that had not dropped out during the clarification process. The bag filters used during water treatment ranged in size from 5 to 50 microns and were rated for over 100 gpm. Spent bag filters were disposed at CWM's TSCA landfill in Model City, New York.

Following bag filtration, the effluent was sent through a granular activated carbon (GAC) polishing step where two Westates Carbon Aqua-Scrub 2,500-pound bulk carbon units were placed in series to adsorb trace PCBs and other constituents that may be present in ground water. Treated effluent was then pumped to one of four 21,000-gallon closed-top style Baker holding tanks. The treated water was then composite sampled from each holding tank prior to allowing discharge to the existing injection trench and analyzed for PCBs by USEPA Method 8080 and for total suspended solids (TSS) by USEPA Method 160.2. Upon receipt of acceptable laboratory analytical results indicating total PCBs as non-detectable and TSS as less than 100 milligrams per liter (mg/l), the treated water was discharged to an existing injection trench. This process was repeated each time a holding tank neared its holding capacity. A summary of post-treatment ground-water analytical results and the total volume of treated water discharged is presented as Table 8. Analytical support documentation for the post-treatment ground-water sample results is included as Appendix X.

4.2.11 Soil Staging and Conditioning

Prior to being loaded for transportation off site, excavated soil with a high moisture content generated during AOC removal activities was transported to the SHA for staging and conditioning. At the SHA, the stockpiled soil was periodically moved (tilled) within the confines of the area with a Komatsu PC-200 track-mounted excavator to promote dewatering of the soil. Dewatering of the soil was necessary for two reasons. The primary reason was to remove enough trapped moisture so that soil would pass a paint filter test. Passing a paint filter test is one of the criteria established by CWM for disposal of soil at its landfill. The second reason was to reduce overall moisture weight, thus reducing disposal costs. In some cases, the soil was

sufficiently dry to be direct loaded into dump trailers without being transferred to the SHA. In these circumstances, the intermediate step of soil staging and conditioning was not required.

4.2.12 Removal of Existing Injection Trench

Following all water treatment and discharging activities, the existing injection (formerly called the interceptor) trench was removed. The trench was located outside of the exclusion zone as shown on Figure 28 and was constructed of ¼" steel plates and three 3 foot diameter by 6 foot deep sections of reinforced concrete pipe. The dimensions of the trench were approximately 375 feet long by 1 foot wide and 3 feet deep. The sidewalls of the interceptor trench were constructed of ¼" steel plate bolted together on one side with 11 gauge perforated steel plate on the other.

All scrap steel and existing pipe bollards surrounding the trench were removed with a Komatsu PC-200 track-mounted excavator. The removed materials were decontaminated, loaded, and transported off site for recycling at Naporano Iron & Metal Company of Newark, New Jersey. Scrap tickets for recycled steel are included as Appendix Q. The pipe bollards, which were filled with concrete and were not able to be recycled, were disposed at the Hackensack Meadowlands Development Commission, the designated solid waste facility for Hudson County.

The open area exposed due to the removal of the injection trench was backfilled and compacted to original grade using material having the same physical properties as that which surrounded the trench, clean crushed stone.

4.2.13 Surface Capping

Upon completion of all excavation and backfilling operations, the site was prepared for installation of the asphalt cap. The surface cap had been proposed in the approved RAWP as a final engineering control necessary for the completion of a Declaration of Environmental Restriction (DER) which is later discussed in Section 7.0. A site plan showing the proposed location of the asphalt cap and a section detail have been included as Figures 37 and 38, respectively.

4.2.13.1 Preparation for Capping

Preparation for capping included the demolition and removal of miscellaneous surface debris, concrete pads, and concrete foundations where required to ensure a sound subgrade. Upon removal of these materials from the proposed cap area, preparation of the cap subgrade began. Materials used to construct the cap subgrade included existing site materials and imported materials that had been brought on site to construct various construction support facilities and temporary controls. Imported materials re-used included the NJDOT No. 2 crushed stone used for construction access roads and the clean stone that was used beneath the SHA and the equipment decontamination area.

Prior to grading these materials, a preliminary site survey layout was conducted by a New Jersey-licensed surveyor whereby grade stakes were installed that established finished elevations for the proposed asphalt cap. The grade stakes were used during grading operations to determine the depth and area of "cuts and fills" necessary to attain finish elevations. Grading operations were completed using Komatsu D-37P and Caterpillar D-6 bulldozers.

During subgrade preparation operations, it was determined that based on proposed finish grade elevations, the asphalt cap would be approximately 6 inches lower along the northern and eastern perimeter than existing elevations in these areas. To remedy this problem, proposed finish grade elevations were modified by increasing proposed finish grade elevation contours at the northern and eastern sides of the cap from 9.00 and 9.50 to 9.50 and 9.75, respectively. All other finish grade elevations were left unchanged. By raising these perimeter elevations, slopes to the north and east were slightly reduced but still maintained positive sheet-flow drainage of rain water as designed. This modification is further illustrated in the asphalt cap as-built survey included as Plate 2. Upon completion of grading operations, all subgrade material was compacted using a Bomag vibratory steel-wheeled roller.

Following completion of subgrade preparation activities, all equipment used during the course of these operations were decontaminated as described in Subsection 4.2.15.

4.2.13.2 Installation of Asphalt Cap

The following is a description of procedures and materials used during the installation of the asphalt cap.

Dense Graded Aggregate Subbase Course

Upon proper grading and compaction of the subgrade, the dense graded aggregate subbase course material was brought on site, placed, graded and compacted. This subbase course was the first component of the 12-inch cap to be installed and consisted of a 6-inch compacted layer of NJDOT Designation I-2 soil aggregate. Before any fill materials were brought on site, a letter of certification stating that all fill materials proposed for use were free of contaminants was provided by the quarry, as required in N.J.A.C 7:26E-6.4(b)2. A copy of this letter is provided in Appendix O.

The subbase material was delivered to the site in dump trucks and placed directly on the existing subgrade. To avoid contact with contaminated soils by incoming dump trucks and other equipment, the material was placed in such a fashion that as the material was dumped, bulldozers and graders pushed the material outward. This enabled construction vehicles to remain on newly installed clean material at all times and not come in contact with existing potentially contaminated surface soils.

Using the grade stakes installed during subgrade operations, material was rough graded using a Caterpillar D-6 bulldozer. After the subbase material was sufficiently rough graded, a Caterpillar G-12 motor grader was used to achieve final grade. The graded materials were then compacted using a Bomag vibratory steel-wheeled roller.

Once the subbase was graded and compacted, it was tested for sufficient compaction using a Troxler Model 3411B Nuclear Density Gauge. All compacted subbase materials were verified as compacted to a density of no less than 95% of the maximum density of the material as determined by a Standard Proctor test. Compaction results for the subbase course are presented in Appendix R.

All subbase course material, placement and compaction conformed to the requirements specified in Sections 203, 301 and 901 of the Standard Specifications for Road and Bridge Construction as amended by the NJDOT in 1989.

Bituminous - Stabilized Base Course Mix I-2

Once the subbase course was placed, compacted and compaction tested, a bituminous-stabilized base course (base course) was installed. The base course was the second component of the 12-inch cap to be installed and consisted of a 4-inch compacted layer of NJDOT Designation I-2 soil aggregate and bituminous materials (asphalt cement).

The base course material was delivered to the site in dump trucks and placed directly into a Blaw-Knox Model PF-2008 Paver. Once the material was placed into the paver, it was spread over the compacted subbase material in 4-inch thick and 10-foot wide lifts. Initially, a test control strip was prepared at the west side of the site in order to facilitate paver setup. Once the test control strip was completed, the placement of the base course was initiated with the paver traveling in a west to east direction. Verification of course thicknesses were measured by field personnel as the material was placed on a continuous basis.

After placement, the asphalt was compacted using a Dynapac steel-wheeled roller. The compacted base course was tested for compaction using a Troxler 4640-B Thin Layer Nuclear Density Gauge and verified to have an acceptable void space of 2 to 8%. Compaction results for the base course are also presented in Appendix R.

All base course materials, placement and compaction conformed to the requirements specified in Sections 304, 404, and 903 of the Standard Specifications for Road and Bridge Construction as amended by the NJDOT in 1989.

Bituminous Concrete Surface Course, Mix I-5

Once the installation of the base course was installed, compacted, and tested, a bituminous concrete surface course (surface course) was installed. The surface course was the third and final component of the 12-inch cap to be installed and consisted of a 2-inch compacted layer of NJDOT Designation I-5 soil aggregate and bituminous materials (asphalt cement).

The surface course material was delivered to the site in dump trucks and placed directly into a Blaw-Knox Model PF-2008 Paver. Once the material was dumped into the paver, it was spread over the previously placed base course material in 2-inch thick and 10-foot wide lifts. After a

test control strip was prepared at the west side of the site, the placement of the surface course was initiated with the paver traveling in a west to east direction.

After placement, the surface course was compacted using a Dynapac steel-wheeled roller. All surface course was compaction tested using a Troxler 4640-B Thin Layer Nuclear Density Gauge and verified to have an acceptable void space of 2-8%. Compaction results for the surface course are also presented in Appendix R.

All bituminous surface course materials, placement and compaction conformed to the requirements specified in Sections 304, 404, and 903 of the Standard Specifications for Road and Bridge Construction as amended by the NJDOT in 1989.

4.2.14 Post-Excavation Site Survey

Following all excavation and restoration activities, the services of a New Jersey State-licensed land surveyor was retained to resurvey the site. Following the survey, a topographic plan was generated to show the post-excavation surface grade, site topography, and the location of all remediated AOCs as defined by the remaining in-place sheet-piling as well as the asphalt cap. The post-excavation survey showing the as-built topography of the asphalt cap as measured on a 50' grid is included as Plate 2.

4.2.15 Equipment, Material and Personnel Decontamination

All equipment and material used during the course of the RA activities which entered the exclusion zone and was used in contaminated or potentially contaminated areas received extensive decontamination prior to release from the exclusion zone. Equipment and materials decontaminated during RA activities included excavators, support trucks, backhoes, loaders, bulldozers, pumps, and water treatment system components (clarifiers, holding tanks, bag filters, and pipelines). These items were decontaminated by brushing and scraping away any accumulation of soil or sediment in a designated decontamination area. Following this procedure, an extensive pressure washing process was then used to remove any adhering residual soils on sediment remaining on the equipment or material. All rinseates were collected for treatment in the water treatment system while residual soils were transported back to the SHA.

Personnel decontamination procedures were initiated at the on-set of RA activities and continued until final demobilization. The procedures for personnel decontamination as well as additional information regarding equipment decontamination procedures are discussed in detail in the site HASP previously submitted with the RAWP.

4.2.16 Final Site Restoration

All disturbed areas of the site not covered by the asphalt cap were restored to existing (pre-Remedial Action) conditions. Restoration activities included the spreading of clean crushed stone around the perimeter of the newly installed cap to a width of approximately five feet. This work allowed an even transition into previously undisturbed areas.

4.2.17 Demobilization of Personnel, Equipment and Materials

Personnel, equipment and materials were demobilized periodically as they were no longer needed. The final construction support facility to be demobilized was the command post, which was removed from the site on August 17, 1994. All equipment and materials were decontaminated prior to demobilization, as previously described in Section 4.2.15. A final schedule showing the actual dates and durations of each RA activity is presented as Appendix S.

4.2.18 Progress Reporting Requirements

Progress Reporting was required during RA activities and performed in accordance with N.J.A.C. 7:26E-6.5 since the proposed RA implementation schedule showed RA activities exceeding three months. A total of five monthly progress reports were previously submitted for the months of April, May, June, July, and August of 1994 to the Department during the course of the RA.

4.3 Post-Remedial Action Activities

4.3.1 Post-Remedial Action Ground-Water Sampling

The approved long-term ground-water monitoring program incorporates periodic sampling and analysis of pre-determined compliance monitoring well locations which will determine ground-water quality. The first event of long-term monitoring was the post-remedial action ground-water sampling which took place on August 2, 1994 immediately after the completion of

intrusive activities. The sampling methods and protocols adhered to during this sampling event were in accordance with the Department's May 1992 Field Sampling Procedures Manual, Roux Associates, Inc.'s previously submitted QAPP, and as further described in this section.

Prior to sample collection, the depth to water and depth to bottom of each well was measured, using an electronic water-level indicator in order to calculate the volume of standing water in each well. Wells were then purged three to five times the volume of standing water from each well using a pre-cleaned, low flow, stainless steel submersible or low flow aboveground jet pump. The electronic water-level indicator and all pumps were decontaminated with a non-phosphate detergent wash followed by a potable water rinse and distilled water rinse between wells. The pH, specific conductivity, dissolved oxygen, and temperature were collected from each well before purging wells, after purging, and after sampling.

Ground-water samples were collected at pre-approved compliance monitoring well locations MW10S, MW10D, MW8S, MW8D, MW13S, MW13D, MW14S, and MW14D. The location of each compliance monitoring well is shown on Figure 5. Samples were collected using bottom-loading Teflon® bailers with Teflon®/stainless steel leaders which were thoroughly pre-cleaned in accordance with the Departments Field Sampling Procedures Manual dated May 1992 and wrapped in aluminum foil prior to use. After the wells recovered from purging operations, each bailer was slowly lowered into the well (to prevent aeration of the water) until partially submerged. Then, following removal, the first bailer was utilized for sample collection. New, non-absorbent, polypropylene cord was used to lower the bailers, and clean disposal latex gloves were worn while handling the sampling equipment and containers.

The samples were collected in three 40 ml, glass laboratory-supplied containers provided by Enseco, Inc., a Department-approved laboratory. Field personnel recorded the following in the field book after sample collection.

- well number
- pH, conductivity, temperature, and dissolved oxygen measurement after sampling
- analyses requested
- start/stop time of sampling

- sampling method
- number of bottles
- preservation

Each sample was then labeled with sample date and time, sample designation, site location, sample method and sampler initials. Samples were then enclosed in resealable plastic bags and paced on ice in an insulated cooler. Chain of custody (COC) forms were completed for each day of sampling to include client, site location, sample designation, time and date of collection, methods of analysis, preservation, laboratory samples were submitted to, and method of delivery. The COC was then signed to document that samples were relinquished and subsequently received by the courier. Samples were documented as received by employees of Impulse Courier services and delivered to Enseco, Inc. where analysis of the samples was performed.

A field blank was collected to provide quality assurance and quality control over sampling and analytical procedures. The field blank sample was obtained by pouring laboratory-supplied, deionized, analyte-free water through a clean bailer into the appropriate sample containers. Following collection of all samples, the coolers were secured with numbered custody seals and shipped via courier to the approved laboratory.

All ground-water samples including field blanks were analyzed for individual PCB congeners utilizing USEPA Method 8080. The PQL of this analytical method is $0.5 \mu\text{g}/\ell$. The ground-water sampling data was reported in a manner consistent with the New Jersey Reduced Deliverables Format with over 25% of the data reported in the New Jersey Regulatory Data Package as required by the approved RAWP. Post-remedial action ground-water sampling results from all eight compliance monitoring wells were non-detect above the $0.25 \mu\text{g}/\ell$ reporting limit. The results are summarized in Table 9. Analytical support documentation of post-remedial action ground-water sampling is included in Appendix U. Copies of Well Sampling Data Logs are provided in Appendix E.

Post-remedial action sampling will be used in conjunction with future long-term ground-water monitoring results to determine the impact, if any, of RA activities on ground-water conditions.

Additional long-term monitoring is required for the site and has been described in Subsection 6.1.

4.4 Transportation and Disposal of Concrete Demolition Debris

Following previous demolition activities performed by Monsanto in 1992, a number of concrete slabs and foundations remained at or above grade. These foundations, in many instances, required further demolition since their elevations were higher than the proposed subgrade elevations of the proposed asphalt cap. Following demolition of these pads, some of the debris generated was small enough for use as fill material in the asphalt cap subgrade, however, several hundred tons of concrete debris required transport and disposal at CWM's TSCA landfill in Model City, New York. Prior to being loaded into dump trailers for transportation and disposal at CWM's TSCA landfill, all concrete debris was reduced to less than 4 feet in length in order to be accepted at the landfill. Several permitted hazardous waste trucking companies were subcontracted by CWM as transporters of the concrete demolition debris. Prior to being weighed and released from the site, all dump trailers were inspected for proper placards, labels and New Jersey and New York hazardous waste transporter permits. A total of 308.18 tons of concrete demolition debris were transported and disposed as shown in the Concrete Disposal Log included as Table 10. Copies of hazardous waste manifests and Certificates of Disposal for the concrete demolition debris are included in Appendix Y.

4.5 Transportation and Disposal of Contaminated Soil

All PCB-impacted soil generated from excavation activities was loaded into dump trailers for transportation and disposal at CWM's TSCA landfill in Model City, New York. Several permitted hazardous waste trucking companies were subcontracted by CWM as transporters of the contaminated soil. Prior to being weighed and released from the site, all trailers were inspected for proper placards, labels and New Jersey and New York hazardous waste transporter permits. A total of 5,521.65 tons of contaminated soil were transported and disposed as shown in the Soil Disposal Log included as Table 11. Copies of hazardous waste manifests and Certificates of Disposal for contaminated soil are also included as Appendix Y.

4.6 Transportation and Disposal of Miscellaneous Debris

Upon decontamination and removal of construction support facilities and temporary controls, miscellaneous debris was generated that was subsequently disposed of as a TSCA-regulated material. Miscellaneous debris primarily consisted of PPE, plastic sheeting, SHA liner material, equipment decontamination pad liner material, water treatment system liner material, tarpaulin material, and railroad ties encountered throughout the site during intrusive activities. Miscellaneous debris was loaded into dump trailers for transportation and disposal at CWM's TSCA landfill in Model City, New York. Several permitted hazardous waste trucking companies were subcontracted by CWM as transporters of miscellaneous debris. Prior to being weighed and released from the site, all trailers were inspected for proper placards, labels and New Jersey and New York hazardous waste transporter permits. A total of 67.89 tons of contaminated miscellaneous debris were transported and disposed as shown in the Miscellaneous Debris Disposal Log included as Table 12. Copies of hazardous waste manifests and Certificates of Disposal for miscellaneous debris are included in Appendix Y.

4.7 Transportation and Disposal of Granular Activated Carbon

Upon completion of dewatering and water treatment activities, the water treatment system was dismantled and decontaminated. One component that was dismantled was the granular activated carbon (GAC). The carbon in the units had become contaminated during operation of the water treatment system and required transportation and disposal to a TSCA landfill. All GAC was vacuum pumped into 55-gallon drums, whereby a total of eighteen 55-gallon drums of GAC was generated. Prior to placing the GAC in drums, it was sampled and analyzed for waste characterization. A summary of the GAC sampling results is included as Table 13 and analytical support documentation is provided in Appendix Z.

A new disposal profile for the GAC was obtained from CWM and disposed as its own waste stream. Nineteen drums (1 contained PPE and was disposed of under the original disposal profile) were loaded and transported via a box trailer with proper placards, labels and New Jersey and New York hazardous waste transporter permits for disposal at CWM's Model City, New York permitted TSCA landfill. A total of 3.84 tons of GAC and PPE were transported and disposed as shown in the Granular Activated Carbon Disposal Log included as Table 14. Copies

of hazardous waste manifests and Certificates of Disposal for the spent GAC and PPE are also included in Appendix Y.

5.0 REMEDIAL ACTION COSTS

In accordance with N.J.A.C. 7:26E-5.2, a detailed description of the RA costs of the project including both direct and indirect capital costs and the net present value of anticipated annual operations, maintenance and monitoring costs has been included as Table 15. Department oversight costs were not included in the referenced table since the oversight costs were not known at the time of this writing.

6.0 OPERATION AND MAINTENANCE/REPORTING

6.1 Compliance Monitoring Well Ground-Water Sampling and Reporting

The long-term compliance monitoring well ground-water sampling consists of periodic sampling and analysis of compliance monitoring wells which will yield data regarding long-term ground-water quality. The sampling methods will adhere to the procedures outlined in the Department's May 1992 Field Sampling Procedures Manual and Roux Associates, Inc.'s QAPP included in the approved RAWP. The samples will be analyzed for individual PCB congeners utilizing USEPA Method 8080. At a minimum, the data will be reported in a manner consistent with the New Jersey Reduced Deliverables Format. The PQL of the proposed analytical method for PCBs will be 0.5 $\mu\text{g}/\ell$. The intent of the monitoring program is to be protective of both ground water and surface water.

The following compliance monitoring well array will continue to be used for analytical sampling points:

- Upgradient wells MW-10S and MW-10D
- Downgradient wells MW-8S, MW-8D, MW-13S, MW-13D, MW-14S and MW-14D

A site plan showing the identification and location of compliance monitoring wells has been provided as Figure 5. The first long-term ground-water sampling event was performed on August 2, 1994 after all excavation activities were completed. In addition to this event, semi-annual ground-water sampling for PCBs will be performed for the next three years starting in January 1995 followed by two years of annual sampling. Given this schedule, all long-term compliance monitoring requirements will be completed in the year 2000.

6.2 Asphalt Cap Inspection and Maintenance

The primary purpose of the asphalt cap is to eliminate access to surface soils which may contain PCBs below the site-specific cleanup standards (SCS) of 25 mg/kg, yet still above the Department's direct residential guidance contact level of 0.49 mg/kg PCBs. The cap itself was overdesigned to allow a secondary purpose of using the capped area as a trucking terminal.

Operation and maintenance of the asphalt cap is the only maintenance issue required at this site. The asphalt cap will be visually inspected by Monsanto during each long-term compliance monitoring well ground-water sampling event. The cap will be inspected for any significant cracks, pot-holes, or delaminations that may require repair as well as verification that the cap has not been penetrated by current site owners. All inspections and observations will be documented and corrective action will be performed as necessary. Following the completion of long-term compliance monitoring well ground-water sampling, operation and maintenance responsibilities for the asphalt cap will be transferred to the future site owner.

7.0 SUMMARY OF DECLARATION OF ENVIRONMENTAL RESTRICTIONS

In accordance with the RAWP approval, a Declaration of Environmental Restriction (DER) has been prepared for the site and has been included as Appendix T. The DER provides notice of the existence and location of contaminants at the site, and the restrictions placed upon the use and development of part of the site as a condition of using non-residential soil clean-up standards. The DER is intended to preserve the integrity of the RA by prohibiting any use of the restricted area of the site that results in an unacceptable risk of human or environmental exposure to any residual contamination. As provided in the RAWP approval, the Department-approved DER shall be recorded with the Hudson County Clerk immediately upon request by the Department.

8.0 FINDINGS AND CONCLUSIONS

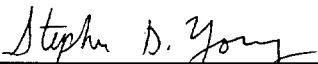
Findings and conclusions of pre-Remedial Action, Remedial Action, and post-Remedial Action activities are summarized below. The general statements presented below are supported by the information included in this report.

- RA activities were initiated on April 4, 1994 and completed on August 25, 1994.
- Base-line ground-water sampling was performed and indicated that PCB concentrations were non-detectable in ground water at the start of RA activities.
- Approximately 305 cubic yards of contaminated soil were excavated from the SSP.
- Post-excavation soil samples in the SSP were collected, analyzed, and validated; and indicated that total PCB concentrations were less than 33 mg/kg at a depth of 9 to 10.5 feet BGS following excavation activities.
- Approximately 806 cubic yards of contaminated soil were excavated from the APSS.
- Post-excavation soil samples in APSS were collected, analyzed, and validated; and indicated that total PCB concentrations were less than 14 mg/kg at a depth of 9 feet BGS following excavation activities.
- Approximately 1,718 cubic yards of contaminated soil were excavated from the inner PDA.
- Post-excavation soil samples in the inner PDA were collected, analyzed, and validated; and indicated that total PCB concentrations were non-detectable at 24 feet BGS following excavation activities.
- Approximately 1,157 cubic yards of contaminated soil were excavated from the outer PDA.


- Post-excavation soil samples in the outer PDA were collected, analyzed, and validated; and indicated that total PCB concentrations were less than 51 mg/kg at a depth of 9 feet BGS following excavation activities.
- Post-Remedial Action ground-water sampling was performed and indicated that PCB concentrations were non-detectable in ground water at the completion of RA activities. This data will be used along with additional long-term ground-water monitoring data to confirm that natural site hydrogeologic conditions and the general immobility of PCBs have prevented any significant migration of PCBs in soil or ground water beyond the three AOCs.
- A total of 5521.65 tons of PCB-contaminated soil were removed from the site and disposed at CWM's TSCA landfill in Model City, New York.
- A total of 308.18 tons of PCB-contaminated concrete demolition debris were removed from the site and disposed at CWM's TSCA landfill in Model City, New York.
- A total of 67.89 tons of miscellaneous debris were removed from the site and disposed at CWM's TSCA landfill in Model City, New York.
- A total of 3.84 tons of granular activated carbon (including one drum of PPE) were removed from the site and disposed at CWM's TSCA landfill in Model City, New York.
- All AOCs have been remediated and all RA activities have been completed.

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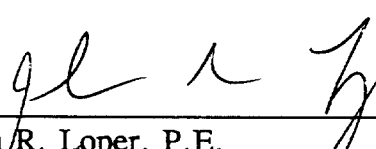
Respectfully Submitted,
ROUX ASSOCIATES, INC



Stephen D. Young, CHMM
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John R. Loper, P.E.
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1 Department and Monsanto Chemical Company, June 24, 1989. Administrative Consent Order.

2 Department Correspondence dated January 13, 1992 (ECRA/ACO issues).

3 Department correspondence dated November 18, 1993 (Conditional Approval of Remedial Action Workplan.)

4 Department Correspondence dated March 28, 1994 (Final RAWP approval).

5 Department, June 7, 1993. Technical Requirements for Site Remediation, N.J.A.C. 7:26E.

6 Department Correspondence dated May 7, 1992. (RI Conditional Approval).

7 Roux Associates, Inc., June 18, 1993. Focused Feasibility Study and Identification of Site-Specific Cleanup Standards, Monsanto Kearny Plant, Kearny, New Jersey.

8 Roux Associates, Inc., August 4, 1993. Preliminary Remedial Action Workplan, Monsanto Kearny Plant, Kearny, New Jersey.

9 Roux Associates, Inc., December 18, 1989. Remedial Investigation Workplan, Monsanto Kearny Plant, Kearny, New Jersey.

10 Roux Associates, Inc., May 18, 1990. Remedial Investigation Workplan, Addendum I, Monsanto Kearny Plant, Kearny, New Jersey.

11 Roux Associates, Inc., May 5, 1991. Revised Remedial Investigation Workplan, Addendum II, Monsanto Kearny Plant, Kearny, New Jersey.

12 Roux Associates, Inc., August 30, 1992. Preliminary Remedial Investigation Report, Volumes I, II, III, Monsanto Kearny Plant, Kearny, New Jersey.

13 Department Correspondence dated September 16, 1992. (Focused Feasibility Study Issues).

14 Department, August 20, 1984. Sealing of Abandoned Wells, N.J.A.C. 7:9-9 et seq.

15 Department, May 1992. Field Sampling Procedures Manual.

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OSHA. Hazardous Waste Operation and Emergency Response (HAZWOPER), 29 CFR 1910.120(f).

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U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, & National Institute for Occupational Safety and Health (NIOSH), October 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH, OSHA, USCG, and USEPA.

18

USEPA Region II, May 4, 1987. 40 CFR 761.125, TSCA, Subpart G, PCB Spill Cleanup Policy.

19

Department, March 16, 1992. Contingency Plan and Emergency Procedures, N.J.A.C. 7:26-9.7(i).

20

New Jersey State Soil Conservation Committee, April 1987. Standards for Soil Erosion and Sediment Control in New Jersey.

21

Roux Associates, Inc., Bid Package for Remediation of PCB Contaminated Soils, Monsanto Company, Kearny, New Jersey.

Table 1. Summary of Site Process Operations. Monsanto Company; Kearny, New Jersey.

| Year | Activity |
|------|---------------------------------------------------------------------------------------------------|
| 1955 | Production of phosphoric acid and sodium tripolyphosphate (STP) begins. |
| 1956 | Production of steroxes begins. |
| 1960 | Production of alkylphenols begins. |
| 1966 | Second units of phosphoric acid and STP begin production. |
| 1983 | Older STP unit terminates production. |
| 1985 | All phosphates manufacturing terminates (i.e. phosphoric acid and STP), and units are dismantled. |
| 1990 | Sterox production terminates. |
| 1991 | Alkylphenol production terminates. |

Table 2. Summary of Base-Line Compliance Monitoring Well Ground-Water Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|-------------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| MW-10S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-10D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-8S | ND | ND | ND | ND | ND | ND | ND | ND |
| MS-8D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-14S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-14D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-13S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-13D | ND | ND | ND | ND | ND | ND | ND | ND |
| Field Blank | ND | ND | ND | ND | ND | ND | ND | ND |
| Duplicate | ND | ND | ND | ND | ND | ND | ND | ND |

All results reported in micrograms per liter ($\mu\text{g}/\ell$).

Samples collected on April 14, 1994 and analyzed in accordance with USEPA Method 8080.

ND = Not detected above reporting limits of $0.25 \mu\text{g}/\ell$.

Table 3. Summary of Air Monitoring Analytical Results. Monsanto Company; Kearny, New Jersey.

| Date | Sample I.D. | Sample Parameters | Results |
|---------|---------------|-------------------|---------------------|
| 4/18/94 | M-A-41894-001 | PCB | 0.001U ¹ |
| 4/18/94 | M-A-41894-002 | VOC | 0.004U |
| 4/18/94 | M-A-41894-003 | MET | 0.001 |
| 4/18/94 | M-A-41894-004 | PCB | 0.001U ¹ |
| 4/18/94 | M-A-41894-005 | VOC | 0.003U |
| 4/18/94 | M-A-41894-006 | MET | 0.004 |
| 4/18/94 | M-A-41894-007 | H ₂ S | <1.50 |
| 4/19/94 | M-A-41994-008 | PCB | 0.001U ¹ |
| 4/19/94 | M-A-41994-009 | VOC | 0.023 |
| 4/19/91 | M-A-41994-010 | MET | 0.001 |
| 4/19/94 | M-A-41994-011 | PCB | 0.001U ¹ |
| 4/19/94 | M-A-41994-012 | VOC | 0.016 |
| 4/19/94 | M-A-41994-013 | MET | 0.003 |
| 4/19/94 | M-A-41994-014 | H ₂ S | <0.25 |
| 4/21/94 | M-A-42194-015 | PCB | 0.001U ¹ |
| 4/21/94 | M-A-42194-016 | VOC | 0.003 |
| 4/21/94 | M-A-42194-017 | MET | 0.001U |
| 4/21/94 | M-A-42194-018 | PCB | 0.001U ¹ |
| 4/21/94 | M-A-42194-019 | VOC | 0.003 |
| 4/21/94 | M-A-42194-020 | MET | 0.001U |
| 4/21/94 | M-A-42194-021 | H ₂ S | <2.25 |
| 4/25/94 | M-A-42594-022 | PCB | 0.001U ¹ |
| 4/25/94 | M-A-42594-023 | VOC | 0.004U |
| 4/25/94 | M-A-42594-024 | MET | 0.001U |
| 4/25/94 | M-A-42594-025 | PCB | 0.001U ¹ |
| 4/25/94 | M-A-42594-026 | VOC | 0.004U |
| 4/25/94 | M-A-42594-027 | MET | 0.001U |
| 4/25/94 | M-A-42594-028 | H ₂ S | <0.20 |
| 4/26/94 | M-A-42694-029 | VOC | 0.035 |
| 4/26/94 | M-A-42694-030 | VOC | 0.096 |

All results given in mg/m³ unless otherwise noted.

U = Not detected above PQL.

¹Results given in µg/m³.

PCB = Polychlorinated biphenyl.

VOC = Total volatile organic compounds.

MET = Metals (chromium, arsenic, lead).

H₂S = Hydrogen sulfide.

Table 3. Summary of Air Monitoring Analytical Results. Monsanto Company; Kearny, New Jersey.

| Date | Sample I.D. | Sample Parameters | Results |
|---------|--------------|-------------------|---------------------|
| 4/28/94 | MA-42894-031 | PCB | 0.001U ¹ |
| 4/28/94 | MA-42894-032 | VOC | 0.005U |
| 4/28/94 | MA-42894-033 | MET | 0.001U |
| 4/28/94 | MA-42894-034 | PCB | 0.001U ¹ |
| 4/28/94 | MA-42894-035 | VOC | 0.004U |
| 4/28/94 | MA-42894-036 | MET | 0.001U |
| 4/28/94 | MA-42894-037 | H ₂ S | <0.23 |
| 5/3/94 | M-A-5394-038 | PCB | 0.001U ¹ |
| 5/3/94 | M-A-5394-039 | VOC | 0.005U |
| 5/3/94 | M-A-5394-040 | MET | 0.003 |
| 5/3/94 | M-A-5394-041 | PCB | 0.001U ¹ |
| 5/3/94 | M-A-5394-042 | VOC | 0.004 |
| 5/3/94 | M-A-5394-043 | MET | 0.001U |
| 5/3/94 | M-A-5394-044 | H ₂ S | <0.21 |
| 5/4/94 | M-A-5494-045 | VOC | 0.013 |
| 5/4/94 | M-A-5494-046 | VOC | 0.012 |
| 5/6/94 | M-A-5694-047 | PCB | 0.001U ¹ |
| 5/6/94 | M-A-5694-048 | VOC | 0.005U |
| 5/6/94 | M-A-5694-049 | MET | 0.001U |
| 5/6/94 | M-A-5694-050 | PCB | 0.001U ¹ |
| 5/6/94 | M-A-5694-051 | VOC | 0.005 |
| 5/6/94 | M-A-5694-052 | MET | 0.001 |
| 5/6/94 | M-A-5694-053 | H ₂ S | <0.25 |
| 6/2/94 | M-A-6294-054 | PCB | 0.001U ¹ |
| 6/2/94 | M-A-6294-055 | VOC | 0.004U |
| 6/2/94 | M-A-6294-056 | MET | 0.001U |
| 6/2/94 | M-A-6294-057 | PCB | 0.001U ¹ |
| 6/2/94 | M-A-6294-058 | VOC | 0.010 |
| 6/2/94 | M-A-6294-059 | MET | 0.001U |
| 6/2/94 | M-A-6294-060 | PCB | 0.004 ¹ |
| 6/2/94 | M-A-6294-061 | VOC | 0.004U |
| 6/2/94 | M-A-6294-062 | MET | 0.001U |

All results given in mg/m³ unless otherwise noted.

U = Not detected above PQL.

¹Results given in µg/m³.

PCB = Polychlorinated biphenyl.

VOC = Total volatile organic compounds.

MET = Metals (chromium, arsenic, lead).

H₂S = Hydrogen sulfide.

Table 4. Summary of SSP Post-Excavation Soil Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|----------------------------|-------------|------|------|------|-------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| SSP-1 ¹ | ND | ND | ND | ND | ND | ND | 33 | 33 |
| SSP-2 ¹ | ND | ND | ND | ND | 1,100 | ND | ND | 1,100 |
| Field Blank ^{1,3} | ND | ND | ND | ND | ND | ND | ND | ND |
| SSP-2A ^{2,4} | ND | ND | ND | ND | 6.6 | ND | ND | 6.6 |
| Field Blank ^{2,3} | ND | ND | ND | ND | ND | ND | ND | ND |

Each sample identification comprises three composited sample locations as identified in the approved RAWP.

All results, unless otherwise noted, are reported in milligrams per kilogram (mg/kg).

¹Samples collected on May 31, 1994 and analyzed in accordance with USEPA Method 8080.

²Samples collected on June 2, 1994 and analyzed in accordance with USEPA Method 8080.

³Results reported in micrograms per liter ($\mu\text{g}/\ell$).

⁴These results represent resampling of SSP-2 following removal of an additional 20 cubic yards of impacted soil.

ND = Not detected above reporting limits of 9 mg/kg for SSP-1, 45 mg/kg for SSP-2, and 1.5 mg/kg for SSP-2a.

Table 5. Summary of APSS Post-Excavation Soil Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|----------------------------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| APSS-1 ¹ | ND | ND | ND | ND | 13 | ND | ND | 13 |
| APSS-2 ¹ | ND | ND | ND | ND | 14 | ND | ND | 14 |
| APSS-3 ¹ | ND | ND | ND | ND | 11 | ND | ND | 11 |
| Field Blank ^{1,2} | ND | ND | ND | ND | ND | ND | ND | ND |

Each sample identification comprises three composited sample locations as identified in the approved RAWP.

All results, unless otherwise noted, are reported in milligrams per kilogram (mg/kg).

¹Samples collected on June 9, 1994 and analyzed in accordance with USEPA Method 8080.

²Results reported in micrograms per liter ($\mu\text{g}/\ell$).

ND = Not detected above reporting limits of 1.3 mg/kg for APSS-1 and 1.4 mg/kg for APSS-2 and APSS-3.

Table 6. Summary of Inner PDA Post-Excavation Soil Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|----------------------------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| IPDA-1 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| IPDA-2 ¹ | ND | ND | ND | ND | ND | ND | ND | ND |
| Field Blank ^{1,2} | ND | ND | ND | ND | ND | ND | ND | ND |

Each sample identification comprises three composited sample locations as identified in the approved RAWP.

All results, unless otherwise noted, are reported in milligrams per kilogram (mg/kg).

¹Samples collected on June 28, 1994 and analyzed in accordance with USEPA Method 8080.

²Results reported in micrograms per liter ($\mu\text{g}/\ell$).

ND = Not detected above reporting limits of 1.4 mg/kg for IPDA-1 and 1.5 mg/kg for IPDA-2.

Table 7. Summary of Outer PDA Post-Excavation Soil Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|----------------------------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| OPDA-1 ¹ | ND | ND | ND | ND | 1.9 | ND | ND | 1.9 |
| OPDA-2 ¹ | ND | ND | ND | ND | 51 | ND | ND | 51 |
| OPDA-3 ¹ | ND | ND | ND | ND | 22 | ND | ND | 22 |
| OPDA-4 ¹ | ND | ND | ND | ND | 9.6 | ND | ND | 9.6 |
| Field Blank ^{1,2} | ND | ND | ND | ND | ND | ND | ND | ND |

Each sample identification comprises three composited sample locations as identified in the approved RAWP.

All results, unless otherwise noted, are reported in milligrams per kilogram (mg/kg).

¹Samples collected on July 7, 1994 and analyzed in accordance with USEPA Method 8080.

²Results reported in micrograms per liter ($\mu\text{g}/\ell$).

ND = Not detected above reporting limits of 1.3 mg/kg for OPDA-1, OPDA-3 and OPDA-4 and 6.7 mg/kg for OPDA-2.

Table 8. Summary of Post-Treatment Ground-Water Sampling Results and Volume of Treated Water Discharged. Monsanto Company; Kearny, New Jersey.

| Sample Date | PCB Results ¹ | TSS Results ²
(ppm) | Date of Discharge | Volume Discharged
(Gallons) |
|-------------|--------------------------|-----------------------------------|-------------------|--------------------------------|
| 6/8/94 | ND | 5 | 6/10/94 | 16,500 |
| 6/15/94 | ND | 24 | 6/16/94 | 20,000 |
| 6/16/94 | ND | 19 | 6/17/94 | 20,000 |
| 6/16/94 | ND | 11 | 6/20/94 | 20,000 |
| 6/20/94 | ND | 10 | 6/22/94 | 20,000 |
| 6/22/94 | ND | 9 | 6/24/94 | 14,000 |
| 6/24/94 | ND | 18 | 6/29/94 | 14,000 |
| 6/30/94 | ND | 4 | 7/5/94 | 20,000 |
| 7/1/94 | ND | 17 | 7/6/94 | 20,000 |
| 7/5/94 | ND | 5 | 7/7/94 & 7/8/94 | 20,000 |
| 7/11/94 | ND | 4 | 7/14/94 | 18,000 |
| 7/14/94 | ND | 3 | 7/19/94 | 12,000 |
| | | | | 214,500 |

All results, unless otherwise noted, are reported in micrograms per liter ($\mu\text{g}/\ell$).

¹Polychlorinated Biphenyl (PCB) samples were analyzed in accordance with USEPA Method 8080.

²Total Suspended Solids (TSS) sample results were analyzed in accordance with USEPA Method 160.2

ND = Not detected above reporting of 0.52 $\mu\text{g}/\ell$.

Table 9. Summary of Post-Remedial Action Ground-Water Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|-------------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| MW-10S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-10D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-8S | ND | ND | ND | ND | ND | ND | ND | ND |
| MS-8D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-14S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-14D | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-13S | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-13D | ND | ND | ND | ND | ND | ND | ND | ND |
| Field Blank | ND | ND | ND | ND | ND | ND | ND | ND |
| Duplicate | ND | ND | ND | ND | ND | ND | ND | ND |

All results reported in micrograms per liter ($\mu\text{g}/\ell$).

Samples collected on August 2, 1994 and analyzed in accordance with USEPA Method 8080.

ND = Not detected above reporting limits of $0.25 \mu\text{g}/\ell$.

| Manifest Document # | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 1 | NYB6333813 | 05/03/94 | 05/04/94 | 46,960 | 23.48 | 23.48 | CWM - Model City, NY |
| 2 | NYB6333849 | 05/03/94 | 05/04/94 | 45,320 | 22.66 | 46.14 | CWM - Model City, NY |
| 3 | NYB6333831 | 05/03/94 | 05/04/94 | 44,220 | 22.11 | 68.25 | CWM - Model City, NY |
| 4 | NYB6333822 | 05/03/94 | 05/04/94 | 43,040 | 21.52 | 89.77 | CWM - Model City, NY |
| 5 | NYB6333858 | 05/03/94 | 05/04/94 | 46,800 | 23.40 | 113.17 | CWM - Model City, NY |
| | | | | Daily Total | 113.17 | | |
| 6 | NYB6333354 | 05/05/94 | 05/06/94 | 43,280 | 21.64 | 134.81 | CWM - Model City, NY |
| 7 | NYB6333345 | 05/05/94 | 05/06/94 | 43,160 | 21.58 | 156.39 | CWM - Model City, NY |
| 8 | NYB6333327 | 05/05/94 | 05/06/94 | 42,620 | 21.31 | 177.70 | CWM - Model City, NY |
| 9 | NYB6333336 | 05/05/94 | 05/06/94 | 43,300 | 21.65 | 199.35 | CWM - Model City, NY |
| | | | | Daily Total | 86.18 | | |
| 10 | NYB6333318 | 05/12/94 | 05/13/94 | 43,960 | 21.98 | 221.33 | CWM - Model City, NY |
| 11 | NYB6333498 | 05/12/94 | 05/13/94 | 41,960 | 20.98 | 242.31 | CWM - Model City, NY |
| 12 | NYB6333507 | 05/12/94 | 05/13/94 | 43,460 | 21.73 | 264.04 | CWM - Model City, NY |
| | | | | Daily Total | 64.69 | | |
| 13 | NYB6333426 | 05/13/94 | 05/16/94 | 43,240 | 21.62 | 285.66 | CWM - Model City, NY |
| 14 | NYB6333417 | 05/13/94 | 05/16/94 | 45,040 | 22.52 | 308.18 | CWM - Model City, NY |
| | | | | Daily Total | 44.14 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 15 | SSP | NYB6333408 | 05/17/94 | 05/18/94 | 44,640 | 22.32 | 22.32 | CWM - Model City, NY |
| 16 | SSP | NYB6333867 | 05/17/94 | 05/18/94 | 44,840 | 22.42 | 44.74 | CWM - Model City, NY |
| 17 | SSP | NYB6333876 | 05/17/94 | 05/18/94 | 45,100 | 22.55 | 67.29 | CWM - Model City, NY |
| 18 | SSP | NYB6333399 | 05/17/94 | 05/18/94 | 44,120 | 22.06 | 89.35 | CWM - Model City, NY |
| 19 | SSP | NYB6333381 | 05/17/94 | 05/18/94 | 45,520 | 22.76 | 112.11 | CWM - Model City, NY |
| Daily Total | | | | | | 112.11 | | |
| 20 | PDA | NYB6333372 | 05/18/94 | 05/19/94 | 45,680 | 22.84 | 134.95 | CWM - Model City, NY |
| 21 | PDA | NYB6333363 | 05/18/94 | 05/19/94 | 44,620 | 22.31 | 157.26 | CWM - Model City, NY |
| 22 | PDA | NYB6333561 | 05/18/94 | 05/19/94 | 44,440 | 22.22 | 179.48 | CWM - Model City, NY |
| 23 | PDA | NYB6333552 | 05/18/94 | 05/19/94 | 43,640 | 21.82 | 201.30 | CWM - Model City, NY |
| 24 | PDA | NYB6333543 | 05/18/94 | 05/19/94 | 45,220 | 22.61 | 223.91 | CWM - Model City, NY |
| 25 | PDA | NYB6333885 | 05/18/94 | 05/19/94 | 45,880 | 22.94 | 246.85 | CWM - Model City, NY |
| 26 | PDA | NYB6333534 | 05/18/94 | 05/19/94 | 46,160 | 23.08 | 269.93 | CWM - Model City, NY |
| 27 | PDA | NYB6333525 | 05/18/94 | 05/19/94 | 45,360 | 22.68 | 292.61 | CWM - Model City, NY |
| 28 | PDA | NYB6333516 | 05/18/94 | 05/19/94 | 45,100 | 22.55 | 315.16 | CWM - Model City, NY |
| 29 | PDA | NYB6333489 | 05/18/94 | 05/19/94 | 42,900 | 21.45 | 336.61 | CWM - Model City, NY |
| 30 | PDA | NYB6333471 | 05/18/94 | 05/19/94 | 44,660 | 22.33 | 358.94 | CWM - Model City, NY |
| Daily Total | | | | | | 246.83 | | |
| 31 | APSS | NYB6333462 | 05/19/94 | 05/20/94 | 44,160 | 22.08 | 381.02 | CWM - Model City, NY |
| 32 | APSS | NYB6333453 | 05/19/94 | 05/20/94 | 45,200 | 22.60 | 403.62 | CWM - Model City, NY |
| 33 | APSS | NYB6333444 | 05/19/94 | 05/20/94 | 43,900 | 21.95 | 425.57 | CWM - Model City, NY |
| 34 | APSS | NYB6333894 | 05/19/94 | 05/20/94 | 45,900 | 22.95 | 448.52 | CWM - Model City, NY |
| 35 | APSS | NYB6333903 | 05/19/94 | 05/20/94 | 45,520 | 22.76 | 471.28 | CWM - Model City, NY |
| 36 | APSS | NYB6333912 | 05/19/94 | 05/20/94 | 46,080 | 23.04 | 494.32 | CWM - Model City, NY |
| 37 | APSS | NYB6333435 | 05/19/94 | 05/20/94 | 43,780 | 21.89 | 516.21 | CWM - Model City, NY |
| 38 | APSS | NYB6333678 | 05/19/94 | 05/20/94 | 45,200 | 22.60 | 538.81 | CWM - Model City, NY |
| 39 | APSS | NYB6333669 | 05/19/94 | 05/20/94 | 46,120 | 23.06 | 561.87 | CWM - Model City, NY |
| Daily Total | | | | | | 202.93 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 40 | APSS | NYB6333651 | 05/20/94 | 05/23/94 | 44,340 | 22.17 | 584.04 | CWM - Model City, NY |
| 41 | APSS | NYB6333642 | 05/20/94 | 05/23/94 | 43,640 | 21.82 | 605.86 | CWM - Model City, NY |
| 42 | APSS | NYB6333633 | 05/20/94 | 05/23/94 | 46,280 | 23.14 | 629.00 | CWM - Model City, NY |
| 43 | APSS | NYB6333624 | 05/20/94 | 05/23/94 | 45,280 | 22.64 | 651.64 | CWM - Model City, NY |
| 44 | APSS | NYB6333615 | 05/20/94 | 05/23/94 | 44,420 | 22.21 | 673.85 | CWM - Model City, NY |
| 45 | APSS | NYB6333606 | 05/20/94 | 05/23/94 | 46,920 | 23.46 | 697.31 | CWM - Model City, NY |
| Daily Total | | | | | | 135.44 | | |
| 46 | SSP | NYB6333597 | 05/26/94 | 05/27/94 | 43,460 | 21.73 | 719.04 | CWM - Model City, NY |
| 47 | SSP | NYB6333588 | 05/26/94 | 05/27/94 | 44,740 | 22.37 | 741.41 | CWM - Model City, NY |
| 48 | SSP | NYB6333579 | 05/26/94 | 05/27/94 | 46,040 | 23.02 | 764.43 | CWM - Model City, NY |
| 49 | SSP | NYB6333759 | 05/26/94 | 05/27/94 | 45,760 | 22.88 | 787.31 | CWM - Model City, NY |
| 50 | SSP | NYB6333741 | 05/26/94 | 05/27/94 | 46,220 | 23.11 | 810.42 | CWM - Model City, NY |
| 51 | SSP | NYB6333732 | 05/26/94 | 05/27/94 | 43,440 | 21.72 | 832.14 | CWM - Model City, NY |
| Daily Total | | | | | | 134.83 | | |
| 52 | SSP | NYB6333723 | 05/27/94 | 05/31/94 | 45,960 | 22.98 | 855.12 | CWM - Model City, NY |
| 53 | SSP | NYB6333714 | 05/27/94 | 05/31/94 | 45,760 | 22.88 | 878.00 | CWM - Model City, NY |
| 54 | PDA | NYB6333705 | 05/27/94 | 05/31/94 | 45,700 | 22.85 | 900.85 | CWM - Model City, NY |
| 55 | PDA | NYB6333696 | 05/27/94 | 05/31/94 | 44,140 | 22.07 | 922.92 | CWM - Model City, NY |
| 56 | PDA | NYB6333687 | 05/27/94 | 05/31/94 | 44,840 | 22.42 | 945.34 | CWM - Model City, NY |
| 57 | PDA | NYB6333804 | 05/27/94 | 05/31/94 | 44,880 | 22.44 | 967.78 | CWM - Model City, NY |
| 58 | PDA | NYB6333795 | 05/27/94 | 05/31/94 | 45,140 | 22.57 | 990.35 | CWM - Model City, NY |
| 59 | PDA | NYB6333786 | 05/27/94 | 05/31/94 | 46,120 | 23.06 | 1,013.41 | CWM - Model City, NY |
| Daily Total | | | | | | 181.27 | | |
| 60 | PDA | NYB6333777 | 06/01/94 | 06/02/94 | 43,860 | 21.93 | 1,035.34 | CWM - Model City, NY |
| 61 | PDA | NYB6333768 | 06/01/94 | 06/02/94 | 45,480 | 22.74 | 1,058.08 | CWM - Model City, NY |
| 62 | PDA | NYB7087905 | 06/01/94 | 06/02/94 | 46,380 | 23.19 | 1,081.27 | CWM - Model City, NY |
| Daily Total | | | | | | 67.86 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 63 | SSP | NYB7087896 | 06/07/94 | 06/08/94 | 46,500 | 23.25 | 1,104.52 | CWM - Model City, NY |
| 64 | SSP | NYB7087887 | 06/07/94 | 06/08/94 | 44,980 | 22.49 | 1,127.01 | CWM - Model City, NY |
| 65 | APSS | NYB7087878 | 06/07/94 | 06/08/94 | 45,160 | 22.58 | 1,149.59 | CWM - Model City, NY |
| 66 | APSS | NYB7087869 | 06/07/94 | 06/08/94 | 44,360 | 22.18 | 1,171.77 | CWM - Model City, NY |
| 67 | APSS | NYB7087851 | 06/07/94 | 06/08/94 | 46,000 | 23.00 | 1,194.77 | CWM - Model City, NY |
| Daily Total | | | | | | 113.50 | | |
| 68 | APSS | NYB7087923 | 06/08/94 | 06/09/94 | 45,540 | 22.77 | 1,217.54 | CWM - Model City, NY |
| 69 | APSS | NYB7087914 | 06/08/94 | 06/09/94 | 43,160 | 21.58 | 1,239.12 | CWM - Model City, NY |
| 70 | APSS | NYB7087932 | 06/08/94 | 06/09/94 | 43,320 | 21.66 | 1,260.78 | CWM - Model City, NY |
| Daily Total | | | | | | 66.01 | | |
| 71 | APSS | NYB7087797 | 06/09/94 | 06/10/94 | 44,480 | 22.24 | 1,283.02 | CWM - Model City, NY |
| 72 | APSS | NYB7087806 | 06/09/94 | 06/10/94 | 45,240 | 22.62 | 1,305.64 | CWM - Model City, NY |
| 73 | APSS | NYB7087815 | 06/09/94 | 06/10/94 | 45,000 | 22.50 | 1,328.14 | CWM - Model City, NY |
| 74 | APSS | NYB6333921 | 06/09/94 | 06/10/94 | 46,900 | 23.45 | 1,351.59 | CWM - Model City, NY |
| 75 | APSS | NYB7087833 | 06/09/94 | 06/10/94 | 45,140 | 22.57 | 1,374.16 | CWM - Model City, NY |
| 76 | APSS | NYB6333939 | 06/09/94 | 06/13/94 | 46,460 | 23.23 | 1,397.39 | CWM - Model City, NY |
| Daily Total | | | | | | 136.61 | | |
| 77 | APSS | NYB7087788 | 06/10/94 | 06/13/94 | 45,960 | 22.98 | 1,420.37 | CWM - Model City, NY |
| 78 | APSS | NYB7087824 | 06/10/94 | 06/13/94 | 45,540 | 22.77 | 1,443.14 | CWM - Model City, NY |
| 79 | APSS | NYB7087842 | 06/10/94 | 06/13/94 | 43,780 | 21.89 | 1,465.03 | CWM - Model City, NY |
| Daily Total | | | | | | 67.64 | | |
| 80 | PDA | NYB7087779 | 06/15/94 | 06/16/94 | 44,480 | 22.24 | 1,487.27 | CWM - Model City, NY |
| 81 | PDA | NYB7087761 | 06/15/94 | 06/16/94 | 44,820 | 22.41 | 1,509.68 | CWM - Model City, NY |
| 82 | PDA | NYB7087752 | 06/15/94 | 06/16/94 | 45,340 | 22.67 | 1,532.35 | CWM - Model City, NY |
| 83 | PDA | NYB7087743 | 06/15/94 | 06/16/94 | 45,500 | 22.75 | 1,555.10 | CWM - Model City, NY |
| 84 | PDA | NYB7087941 | 06/15/94 | 06/16/94 | 42,980 | 21.49 | 1,576.59 | CWM - Model City, NY |
| 85 | PDA | NYB7087959 | 06/15/94 | 06/16/94 | 43,820 | 21.91 | 1,598.50 | CWM - Model City, NY |
| Daily Total | | | | | | 133.47 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|--------------------|-----------------|-------------------|----------------------|
| 113 | PDA | NYB7088058 | 06/22/94 | 06/23/94 | 45,980 | 22.99 | 2,230.03 | CWM - Model City, NY |
| 114 | PDA | NYB7088067 | 06/22/94 | 06/23/94 | 47,260 | 23.63 | 2,253.66 | CWM - Model City, NY |
| 115 | PDA | NYB7088076 | 06/22/94 | 06/23/94 | 47,240 | 23.62 | 2,277.28 | CWM - Model City, NY |
| 116 | PDA | NYB7087599 | 06/22/94 | 06/23/94 | 45,660 | 22.83 | 2,300.11 | CWM - Model City, NY |
| 117 | PDA | NYB7087419 | 06/22/94 | 06/23/94 | 45,440 | 22.72 | 2,322.83 | CWM - Model City, NY |
| 118 | PDA | NYB7087428 | 06/22/94 | 06/24/94 | 45,420 | 22.71 | 2,345.54 | CWM - Model City, NY |
| 119 | PDA | NYB7087437 | 06/22/94 | 06/23/94 | 44,520 | 22.26 | 2,367.80 | CWM - Model City, NY |
| 120 | PDA | NYB7087446 | 06/22/94 | 06/23/94 | 44,180 | 22.09 | 2,389.89 | CWM - Model City, NY |
| 121 | PDA | NYB7087455 | 06/22/94 | 06/23/94 | 46,560 | 23.28 | 2,413.17 | CWM - Model City, NY |
| 122 | PDA | NYB7088085 | 06/22/94 | 06/23/94 | 41,800 | 20.90 | 2,434.07 | CWM - Model City, NY |
| 123 | PDA | NYB7088094 | 06/22/94 | 06/23/94 | 44,200 | 22.10 | 2,456.17 | CWM - Model City, NY |
| | | | | | Daily Total | 249.13 | | |
| 124 | PDA | NYB7089768 | 06/23/94 | 06/24/94 | 43,440 | 21.72 | 2,477.89 | CWM - Model City, NY |
| 125 | PDA | NYB7088103 | 06/23/94 | 06/24/94 | 46,680 | 23.34 | 2,501.23 | CWM - Model City, NY |
| 126 | PDA | NYB7089759 | 06/23/94 | 06/24/94 | 43,840 | 21.92 | 2,523.15 | CWM - Model City, NY |
| 127 | PDA | NYB7089777 | 06/23/94 | 06/24/94 | 44,820 | 22.41 | 2,545.56 | CWM - Model City, NY |
| 128 | PDA | NYB7089786 | 06/23/94 | 06/24/94 | 46,100 | 23.05 | 2,568.61 | CWM - Model City, NY |
| 129 | PDA | NYB6334011 | 06/23/94 | 06/27/94 | 48,880 | 24.44 | 2,593.05 | CWM - Model City, NY |
| 130 | PDA | NYB7089795 | 06/23/94 | 06/24/94 | 45,920 | 22.96 | 2,616.01 | CWM - Model City, NY |
| 131 | PDA | NYB7089804 | 06/23/94 | 06/24/94 | 46,060 | 23.03 | 2,639.04 | CWM - Model City, NY |
| 132 | PDA | NYB7089813 | 06/23/94 | 06/24/94 | 44,280 | 22.14 | 2,661.18 | CWM - Model City, NY |
| 133 | PDA | NYB7089822 | 06/23/94 | 06/24/94 | 43,720 | 21.86 | 2,683.04 | CWM - Model City, NY |
| | | | | | Daily Total | 226.87 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 134 | PDA | NYB7089831 | 06/29/94 | 06/30/94 | 42,840 | 21.42 | 2,704.46 | CWM - Model City, NY |
| 135 | PDA | NYB7089849 | 06/29/94 | 06/30/94 | 42,360 | 21.18 | 2,725.64 | CWM - Model City, NY |
| 136 | PDA | NYB7089858 | 06/29/94 | 06/30/94 | 43,700 | 21.85 | 2,747.49 | CWM - Model City, NY |
| 137 | PDA | NYB7087464 | 06/29/94 | 06/30/94 | 44,980 | 22.49 | 2,769.98 | CWM - Model City, NY |
| 138 | PDA | NYB6334038 | 06/29/94 | 06/30/94 | 45,880 | 22.94 | 2,792.92 | CWM - Model City, NY |
| 139 | PDA | NYB6334047 | 06/29/94 | 06/30/94 | 44,340 | 22.17 | 2,815.09 | CWM - Model City, NY |
| 140 | PDA | NYB6334056 | 06/29/94 | 06/30/94 | 46,400 | 23.20 | 2,838.29 | CWM - Model City, NY |
| 141 | PDA | NYB6334029 | 06/29/94 | 06/30/94 | 46,560 | 23.28 | 2,861.57 | CWM - Model City, NY |
| 142 | PDA | NYB7087113 | 06/29/94 | 06/30/94 | 45,760 | 22.88 | 2,884.45 | CWM - Model City, NY |
| 143 | PDA | NYB7087473 | 06/29/94 | 06/30/94 | 44,880 | 22.44 | 2,906.89 | CWM - Model City, NY |
| 144 | PDA | NYB7087482 | 06/29/94 | 06/30/94 | 44,000 | 22.00 | 2,928.89 | CWM - Model City, NY |
| 145 | PDA | NYB7087491 | 06/29/94 | 06/30/94 | 44,100 | 22.05 | 2,950.94 | CWM - Model City, NY |
| 146 | PDA | NYB7087518 | 06/29/94 | 07/01/94 | 42,860 | 21.43 | 2,972.37 | CWM - Model City, NY |
| 147 | PDA | NYB7089867 | 06/29/94 | 06/30/94 | 43,960 | 21.98 | 2,994.35 | CWM - Model City, NY |
| 148 | PDA | NYB7087509 | 06/29/94 | 07/01/94 | 46,680 | 23.34 | 3,017.69 | CWM - Model City, NY |
| Daily Total | | | | | | 334.65 | | |
| 149 | PDA | NYB7089876 | 06/30/94 | 07/01/94 | 44,640 | 22.32 | 3,040.01 | CWM - Model City, NY |
| 150 | PDA | NYB7089885 | 06/30/94 | 07/01/94 | 45,060 | 22.53 | 3,062.54 | CWM - Model City, NY |
| 151 | PDA | NYB7089894 | 06/30/94 | 07/01/94 | 46,120 | 23.06 | 3,085.60 | CWM - Model City, NY |
| 152 | PDA | NYB7087221 | 06/30/94 | 07/01/94 | 46,420 | 23.21 | 3,108.81 | CWM - Model City, NY |
| 153 | PDA | NYB7087212 | 06/30/94 | 07/01/94 | 45,360 | 22.68 | 3,131.49 | CWM - Model City, NY |
| 154 | PDA | NYB7087203 | 06/30/94 | 07/01/94 | 44,520 | 22.26 | 3,153.75 | CWM - Model City, NY |
| 155 | PDA | NYB7089903 | 06/30/94 | 07/01/94 | 47,620 | 23.81 | 3,177.56 | CWM - Model City, NY |
| 156 | PDA | NYB7087185 | 06/30/94 | 07/01/94 | 47,820 | 23.91 | 3,201.47 | CWM - Model City, NY |
| 157 | PDA | NYB7087176 | 06/30/94 | 07/01/94 | 47,460 | 23.73 | 3,225.20 | CWM - Model City, NY |
| 158 | PDA | NYB7089912 | 06/30/94 | 07/01/94 | 42,860 | 21.43 | 3,246.63 | CWM - Model City, NY |
| 159 | PDA | NYB7087527 | 06/30/94 | 07/01/94 | 47,420 | 23.71 | 3,270.34 | CWM - Model City, NY |
| 160 | PDA | NYB7087536 | 06/30/94 | 07/01/94 | 45,360 | 22.68 | 3,293.02 | CWM - Model City, NY |
| 161 | PDA | NYB7087545 | 06/30/94 | 07/01/94 | 47,600 | 23.80 | 3,316.82 | CWM - Model City, NY |
| 162 | PDA | NYB7087554 | 06/30/94 | 07/01/94 | 45,540 | 22.77 | 3,339.59 | CWM - Model City, NY |
| 163 | PDA | NYB7087563 | 06/30/94 | 07/01/94 | 44,220 | 22.11 | 3,361.70 | CWM - Model City, NY |
| Daily Total | | | | | | 344.01 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|--------------------|-----------------|-------------------|----------------------|
| 189 | PDA | NYB7012017 | 07/06/94 | 07/07/94 | 44,900 | 22.45 | 3,947.65 | CWM - Model City, NY |
| 190 | PDA | NYB7054002 | 07/06/94 | 07/07/94 | 44,700 | 22.35 | 3,970.00 | CWM - Model City, NY |
| 191 | PDA | NYB7089534 | 07/06/94 | 07/07/94 | 44,860 | 22.43 | 3,992.43 | CWM - Model City, NY |
| 192 | PDA | NYB7089516 | 07/06/94 | 07/07/94 | 45,520 | 22.76 | 4,015.19 | CWM - Model City, NY |
| 193 | PDA | NYB7089507 | 07/06/94 | 07/07/94 | 46,260 | 23.13 | 4,038.32 | CWM - Model City, NY |
| 194 | PDA | NYB7089525 | 07/06/94 | 07/07/94 | 45,140 | 22.57 | 4,060.89 | CWM - Model City, NY |
| 195 | PDA | NYB7089471 | 07/06/94 | 07/07/94 | 45,500 | 22.75 | 4,083.64 | CWM - Model City, NY |
| 196 | PDA | NYB7089489 | 07/06/94 | 07/07/94 | 44,580 | 22.29 | 4,105.93 | CWM - Model City, NY |
| 197 | PDA | NYB7089498 | 07/06/94 | 07/07/94 | 44,800 | 22.40 | 4,128.33 | CWM - Model City, NY |
| 198 | PDA | NYB7089417 | 07/06/94 | 07/07/94 | 44,280 | 22.14 | 4,150.47 | CWM - Model City, NY |
| 199 | PDA | NYB7089426 | 07/06/94 | 07/07/94 | 44,020 | 22.01 | 4,172.48 | CWM - Model City, NY |
| 200 | PDA | NYB7053993 | 07/06/94 | 07/07/94 | 44,100 | 22.05 | 4,194.53 | CWM - Model City, NY |
| 201 | PDA | NYB7053984 | 07/06/94 | 07/07/94 | 45,140 | 22.57 | 4,217.10 | CWM - Model City, NY |
| 202 | PDA | NYB7053975 | 07/06/94 | 07/07/94 | 43,900 | 21.95 | 4,239.05 | CWM - Model City, NY |
| 203 | PDA | NYB7053966 | 07/06/94 | 07/07/94 | 44,560 | 22.28 | 4,261.33 | CWM - Model City, NY |
| 204 | PDA | NYB7053957 | 07/06/94 | 07/07/94 | 45,100 | 22.55 | 4,283.88 | CWM - Model City, NY |
| 205 | PDA | NYB7053948 | 07/06/94 | 07/07/94 | 44,180 | 22.09 | 4,305.97 | CWM - Model City, NY |
| | | | | | Daily Total | 380.77 | | |
| 206 | PDA | NYB7053939 | 07/07/94 | 07/08/94 | 47,560 | 23.78 | 4,329.75 | CWM - Model City, NY |
| 207 | PDA | NYB7053831 | 07/07/94 | 07/08/94 | 44,620 | 22.31 | 4,352.06 | CWM - Model City, NY |
| 208 | PDA | NYB7053849 | 07/07/94 | 07/08/94 | 43,580 | 21.79 | 4,373.85 | CWM - Model City, NY |
| 209 | PDA | NYB7089444 | 07/07/94 | 07/08/94 | 43,340 | 21.67 | 4,395.52 | CWM - Model City, NY |
| 210 | PDA | NYB7089435 | 07/07/94 | 07/08/94 | 46,720 | 23.36 | 4,418.88 | CWM - Model City, NY |
| 211 | PDA | NYB7089453 | 07/07/94 | 07/08/94 | 45,320 | 22.66 | 4,441.54 | CWM - Model City, NY |
| 212 | PDA | NYB7089462 | 07/07/94 | 07/08/94 | 46,420 | 23.21 | 4,464.75 | CWM - Model City, NY |
| 213 | PDA | NYB7089381 | 07/07/94 | 07/08/94 | 44,280 | 22.14 | 4,486.89 | CWM - Model City, NY |
| 214 | PDA | NYB7089372 | 07/07/94 | 07/08/94 | 44,740 | 22.37 | 4,509.26 | CWM - Model City, NY |
| 215 | PDA | NYB7053858 | 07/07/94 | 07/08/94 | 43,720 | 21.86 | 4,531.12 | CWM - Model City, NY |
| 216 | PDA | NYB7053867 | 07/07/94 | 07/08/94 | 44,900 | 22.45 | 4,553.57 | CWM - Model City, NY |
| 217 | PDA | NYB7053876 | 07/07/94 | 07/08/94 | 44,660 | 22.33 | 4,575.90 | CWM - Model City, NY |
| | | | | | Daily Total | 269.93 | | |

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| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|--------------------|-----------------|-------------------|----------------------|
| 218 | PDA | NYB7089399 | 07/08/94 | 07/11/94 | 46,360 | 23.18 | 4,599.08 | CWM - Model City, NY |
| 219 | PDA | NYB7089408 | 07/08/94 | 07/11/94 | 45,260 | 22.63 | 4,621.71 | CWM - Model City, NY |
| 220 | PDA | NYB7012512 | 07/08/94 | 07/11/94 | 43,220 | 21.61 | 4,643.32 | CWM - Model City, NY |
| 221 | PDA | NYB6333309 | 07/08/94 | 07/11/94 | 45,140 | 22.57 | 4,665.89 | CWM - Model City, NY |
| 222 | PDA | NYB6333291 | 07/08/94 | 07/11/94 | 47,260 | 23.63 | 4,689.52 | CWM - Model City, NY |
| 223 | PDA | NYB7089354 | 07/08/94 | 07/11/94 | 44,800 | 22.40 | 4,711.92 | CWM - Model City, NY |
| 224 | PDA | NYB7089345 | 07/08/94 | 07/11/94 | 45,060 | 22.53 | 4,734.45 | CWM - Model City, NY |
| 225 | PDA | NYB7089363 | 07/08/94 | 07/11/94 | 46,660 | 23.33 | 4,757.78 | CWM - Model City, NY |
| 226 | PDA | NYB6333282 | 07/08/94 | 07/13/94 | 43,920 | 21.96 | 4,779.74 | CWM - Model City, NY |
| 227 | PDA | NYB7089336 | 07/08/94 | 07/11/94 | 45,280 | 22.64 | 4,802.38 | CWM - Model City, NY |
| 228 | PDA | NYB7089327 | 07/08/94 | 07/11/94 | 45,260 | 22.63 | 4,825.01 | CWM - Model City, NY |
| 229 | PDA | NYB7012503 | 07/08/94 | 07/11/94 | 43,820 | 21.91 | 4,846.92 | CWM - Model City, NY |
| 230 | PDA | NYB6333264 | 07/08/94 | 07/11/94 | 43,880 | 21.94 | 4,868.86 | CWM - Model City, NY |
| 231 | PDA | NYB7012494 | 07/08/94 | 07/11/94 | 43,720 | 21.86 | 4,890.72 | CWM - Model City, NY |
| | | | | | Daily Total | 314.82 | | |
| 232 | PDA | NYB7012485 | 07/11/94 | 07/12/94 | 48,460 | 24.23 | 4,914.95 | CWM - Model City, NY |
| 233 | PDA | NYB7012476 | 07/11/94 | 07/12/94 | 43,840 | 21.92 | 4,936.87 | CWM - Model City, NY |
| 234 | PDA | NYB7012449 | 07/11/94 | 07/12/94 | 46,020 | 23.01 | 4,959.88 | CWM - Model City, NY |
| 235 | PDA | NYB7012458 | 07/11/94 | 07/12/94 | 44,740 | 22.37 | 4,982.25 | CWM - Model City, NY |
| 236 | PDA | NYB7012467 | 07/11/94 | 07/12/94 | 43,960 | 21.98 | 5,004.23 | CWM - Model City, NY |
| | | | | | Daily Total | 113.51 | | |
| 237 | PDA | NYB7012395 | 07/12/94 | 07/13/94 | 44,400 | 22.20 | 5,026.43 | CWM - Model City, NY |
| 238 | PDA | NYB7012422 | 07/12/94 | 07/13/94 | 45,600 | 22.80 | 5,049.23 | CWM - Model City, NY |
| 239 | PDA | NYB7012413 | 07/12/94 | 07/13/94 | 44,600 | 22.30 | 5,071.53 | CWM - Model City, NY |
| 240 | PDA | NYB7089318 | 07/12/94 | 07/13/94 | 45,600 | 22.80 | 5,094.33 | CWM - Model City, NY |
| 241 | PDA | NYB7012404 | 07/12/94 | 07/13/94 | 44,280 | 22.14 | 5,116.47 | CWM - Model City, NY |
| 242 | PDA | NYB7012386 | 07/12/94 | 07/13/94 | 44,120 | 22.06 | 5,138.53 | CWM - Model City, NY |
| 243 | PDA | NYB7089309 | 07/12/94 | 07/13/94 | 46,320 | 23.16 | 5,161.69 | CWM - Model City, NY |
| 244 | PDA | NYB7012377 | 07/12/94 | 07/13/94 | 47,400 | 23.70 | 5,185.39 | CWM - Model City, NY |
| 245 | PDA | NYB7089282 | 07/12/94 | 07/13/94 | 45,920 | 22.96 | 5,208.35 | CWM - Model City, NY |
| 246 | PDA | NYB7089291 | 07/12/94 | 07/13/94 | 45,780 | 22.89 | 5,231.24 | CWM - Model City, NY |
| | | | | | Daily Total | 227.01 | | |

| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|--------------------|-----------------|-------------------|----------------------|
| 247 | PDA | NYB7053894 | 07/13/94 | 07/14/94 | 42,280 | 21.14 | 5,252.38 | CWM - Model City, NY |
| 248 | PDA | NYB7053885 | 07/13/94 | 07/14/94 | 43,500 | 21.75 | 5,274.13 | CWM - Model City, NY |
| 249 | PDA | NYB7053903 | 07/13/94 | 07/14/94 | 45,880 | 22.94 | 5,297.07 | CWM - Model City, NY |
| 250 | PDA | NYB7053912 | 07/13/94 | 07/14/94 | 44,400 | 22.20 | 5,319.27 | CWM - Model City, NY |
| 251 | PDA | NYB7053921 | 07/13/94 | 07/14/94 | 45,100 | 22.55 | 5,341.82 | CWM - Model City, NY |
| 252 | PDA | NYB7012368 | 07/13/94 | 07/14/94 | 44,160 | 22.08 | 5,363.90 | CWM - Model City, NY |
| | | | | | Daily Total | 132.66 | | |
| 253 | PDA | NYB7012359 | 07/14/94 | 07/15/94 | 44,540 | 22.27 | 5,386.17 | CWM - Model City, NY |
| 254 | PDA | NYB7012341 | 07/14/94 | 07/15/94 | 43,060 | 21.53 | 5,407.70 | CWM - Model City, NY |
| 255 | PDA | NYB7012332 | 07/14/94 | 07/15/94 | 44,800 | 22.40 | 5,430.10 | CWM - Model City, NY |
| 256 | PDA | NYB7089264 | 07/14/94 | 07/15/94 | 45,820 | 22.91 | 5,453.01 | CWM - Model City, NY |
| | | | | | Daily Total | 89.11 | | |
| 257 | PDA | NYB7089246 | 07/15/94 | 07/18/94 | 45,740 | 22.87 | 5,475.88 | CWM - Model City, NY |
| 258 | PDA | NYB7089237 | 07/15/94 | 07/18/94 | 45,120 | 22.56 | 5,498.44 | CWM - Model City, NY |
| 259 | PDA | NYB7089255 | 07/15/94 | 07/18/94 | 46,420 | 23.21 | 5,521.65 | CWM - Model City, NY |
| | | | | | Daily Total | 68.64 | | |

850131401

Table 12. Miscellaneous Debris Disposal Log. Monsanto Company; Kearny, New Jersey.

| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 260 ⁽¹⁾ | Site | NYB7089228 | 07/15/94 | 07/18/94 | 8,800 | 4.40 | 4.40 | CWM - Model City, NY |
| | | | | | Daily Total | 4.40 | | |
| 261 ⁽¹⁾ | Site | NYB7089219 | 07/22/94 | 07/25/94 | 35,080 | 17.54 | 21.94 | CWM - Model City, NY |
| 262 ⁽¹⁾ | Site | NYB7089201 | 07/22/94 | 07/25/94 | 45,140 | 22.57 | 44.51 | CWM - Model City, NY |
| | | | | | Daily Total | 40.11 | | |
| 263 ⁽¹⁾ | Site | NYB7087167 | 07/26/94 | 07/27/94 | 46,760 | 23.38 | 67.89 | CWM - Model City, NY |
| | | | | | Daily Total | 23.38 | | |

⁽¹⁾Manifest Documents #260-263 were comprised of miscellaneous debris (PPE, liner materials, tarpaulin and other debris associated with final site cleanup).

850131402

Table 13. Summary of Granular Activated Carbon Sampling Results. Monsanto Company; Kearny, New Jersey.

| Sample ID | PCB Aroclor | | | | | | | Total |
|-----------|-------------|------|------|------|------|------|------|-------|
| | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | |
| CD #1 | ND | ND | ND | ND | 10.2 | ND | ND | 10.2 |
| CD #2 | ND | ND | ND | ND | 5.5 | ND | ND | 5.5 |

All results reported in milligrams per kilogram (mg/kg).

Samples collected on July 18, 1994 and analyzed in accordance with USEPA Method 8080.

ND = Not detected above reporting limits of 0.31 mg/kg for CD#1 and 0.35 mg/kg for CD#2.

Table 14. Granular Activated Carbon Disposal Log. Monsanto Company; Kearny, New Jersey.

Page 1 of 1

| Manifest Document # | Area | Manifest # | Removal Date | Disposal Date | Quantity (lbs.) | Quantity (tons) | Cumulative (tons) | Disposal Facility |
|---------------------|------|------------|--------------|---------------|-----------------|-----------------|-------------------|----------------------|
| 264 ⁽¹⁾ | WTS | NYB7014096 | 08/25/94 | 09/02/94 | 7,680 | 3.84 | 3.84 | CWM - Model City, NY |
| | | | | | Daily Total | 3.84 | | |

⁽¹⁾Manifest Documents #264 was comprised of 18 drums of granular activated carbon from the water treatment system (WTS) and 1 drum of PPE.

850131404

Table 15. Remedial Action Costs. Monsanto Company; Kearny, New Jersey.

| ITEM | TASK DESCRIPTION | COST |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------|
| Direct Costs⁽¹⁾ | | |
| 1. | Contractor Engineering | \$ 43,000 |
| 2. | Health and Safety Program | \$ 127,500 |
| 3. | Removal, Disposal, and Backfilling of Existing Interceptor Trench | \$ 10,500 |
| 4. | Mobilization and Installation of Construction Support Facilities, Temporary Controls and Equipment | \$ 142,000 |
| 5. | Removal of Surface Debris | \$ 18,000 |
| 6. | Furnish and Install Sheet-Piling | \$ 403,000 |
| 7. | Furnish, Install and Maintain Temporary Water Treatment System | \$ 138,000 |
| 8. | Furnish, Install and Maintain Dewatering System | \$ 61,000 |
| 9. | Furnish, Install and Maintain Soil Handling and Decontamination Areas | \$ 78,500 |
| 10. | Demobilization and Decontamination of Construction Support Facilities, Temporary Controls and Equipment | \$ 46,000 |
| 11. | Final Site Restoration | \$ 5,000 |
| 12. | Pre- and Post-Excavation Site Survey and As-Builts | \$ 11,000 |
| 13. | Excavation of the Three AOCs | \$ 128,000 |
| 14. | Backfilling of the Three AOCs | \$ 117,500 |
| 15. | Reinstallation of the Peat Layer | \$ 13,500 |
| 16. | Preparation, Furnishing and Installation of Asphalt Cap | \$ 245,500 |
| 17. | Transportation and Disposal of Contaminated Materials | \$ 1,416,000 |
| 18. | Out-of-Scope Tasks | \$ 1,500 |
| Direct Cost Subtotal | | \$ 3,005,500 |
| Indirect Costs^(1,2) | | |
| 1. | Engineering and Consulting | \$ 324,500 |
| Indirect Cost Subtotal | | \$ 324,500 |
| Ground-Water Compliance Monitoring Costs^(1,3) | | |
| 1. | Ground-Water Monitoring, Sampling and Analytical Services | \$ 130,000 |
| Ground-Water Compliance Monitoring Costs Subtotal | | \$ 130,000 |
| Operations and Maintenance Costs^(1,3) | | |
| 1. | Asphalt Cap | \$ 43,500 |
| 2. | Monitoring Wells | \$ 22,000 |
| 3. | Reserve Fund | \$ 22,000 |
| 4. | Administrative | \$ 43,500 |
| Operations and Maintenance Costs Subtotal | | \$ 131,000 |
| TOTAL COST | | \$ 3,591,000 |

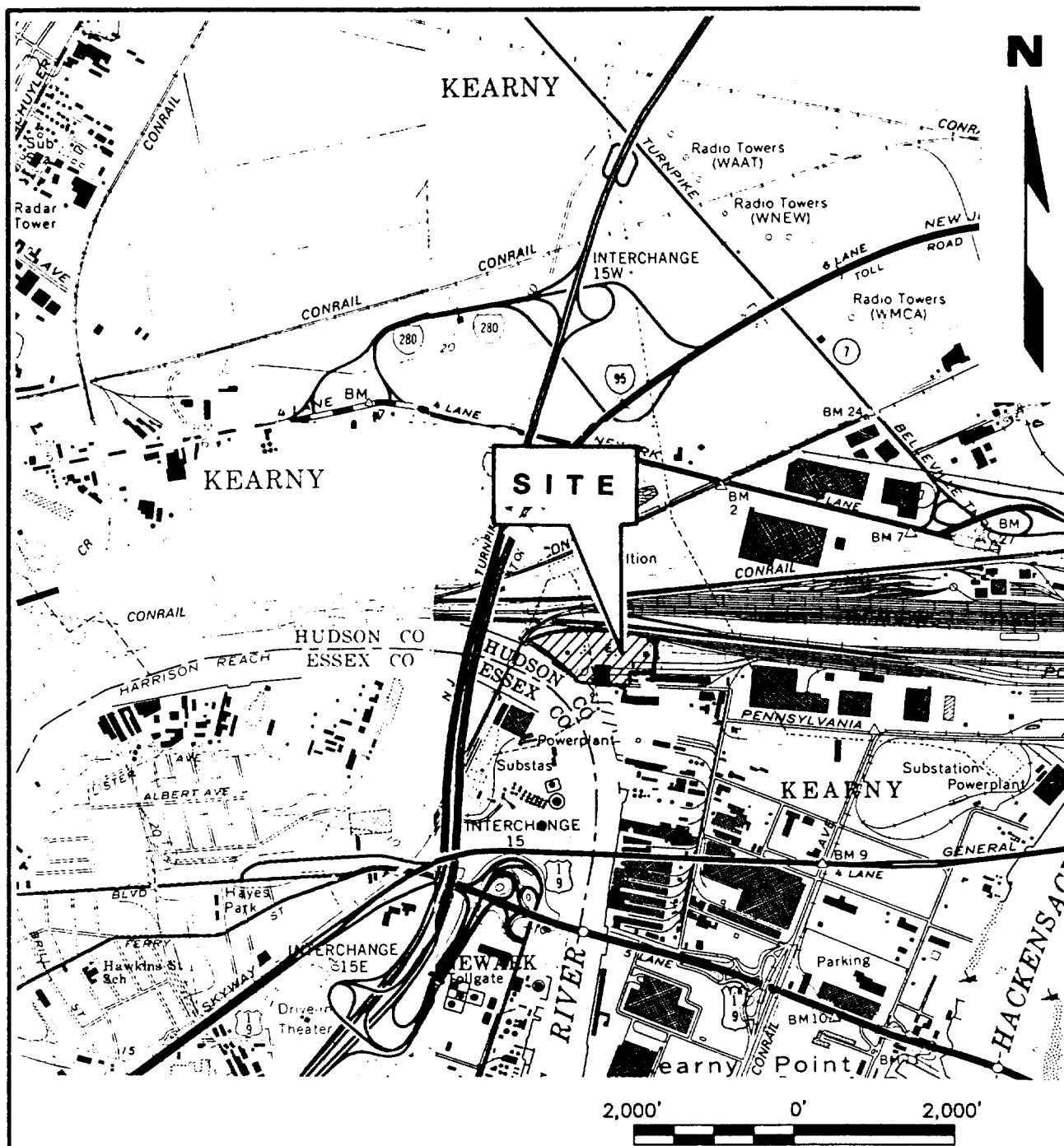
⁽¹⁾All costs have been rounded to the nearest \$500.

⁽²⁾Department technical oversight has not been included as this cost is currently unknown.

⁽³⁾Costs reflect the net present value based on 5% interest for the next 5 years.

FIGURES

850131406



Title:

SITE LOCATION MAP

KEARNY, NEW JERSEY

Prepared For:

MONSANTO, COMPANY

SOURCE:

U.S.G.S. ORANGE, N.J., QUADRANGLE 1955
 U.S.G.S. ELIZABETH, N.J., QUADRANGLE 1967
 U.S.G.S. WEEHAWKEN, N.J., QUADRANGLE 1967
 U.S.G.S. JERSEY CITY, N.J., QUADRANGLE 1967
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 PHOTOREVISED 1981

ROUX

ROUX ASSOCIATES INC
 Environmental Consulting
 & Management

Compiled by: P.J.P.

Date: 10/94

Figure

Prepared by: M.J.V.

Scale: SHOWN

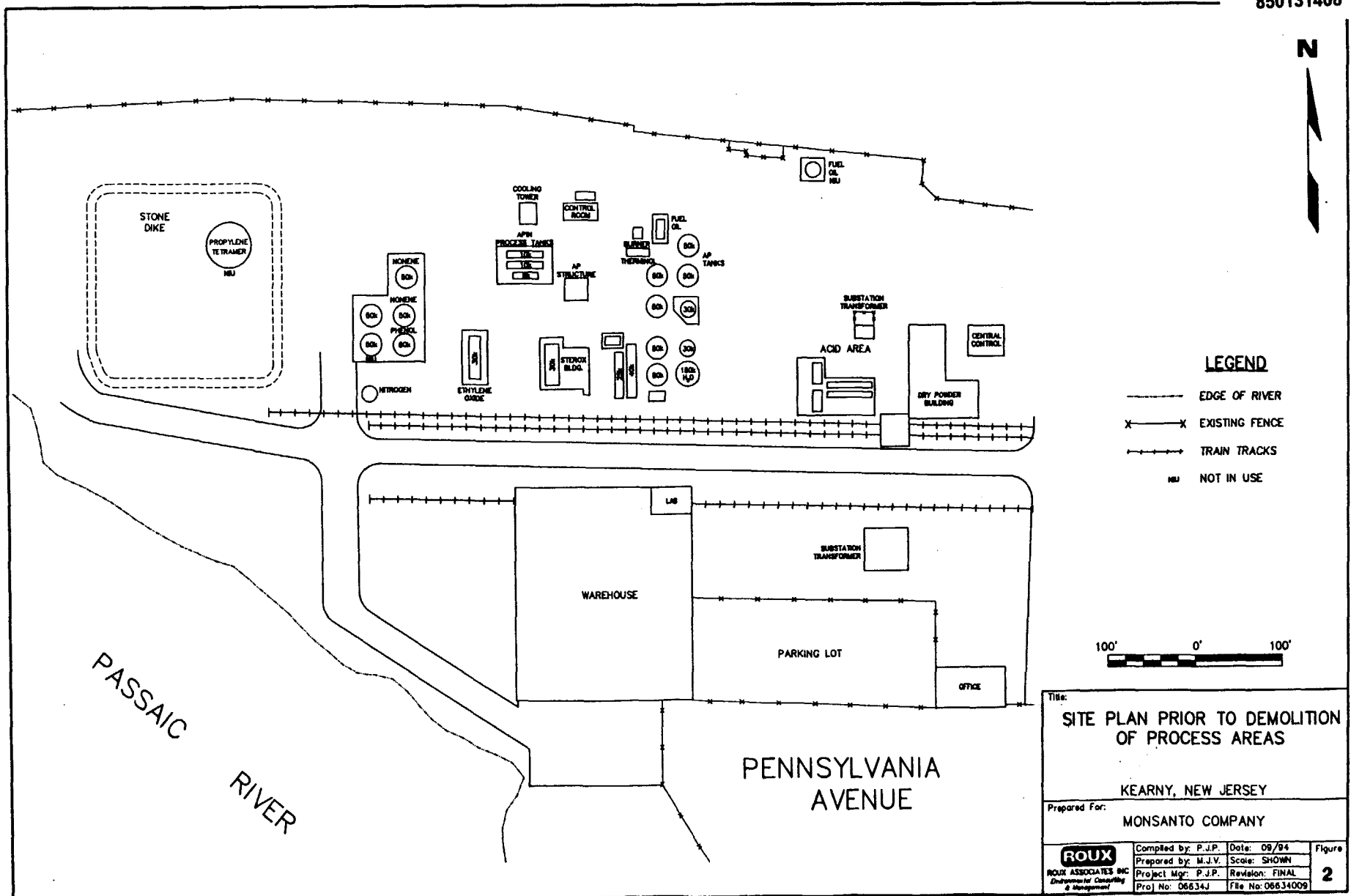
Project Mgr: P.J.P.

Revision: FINAL

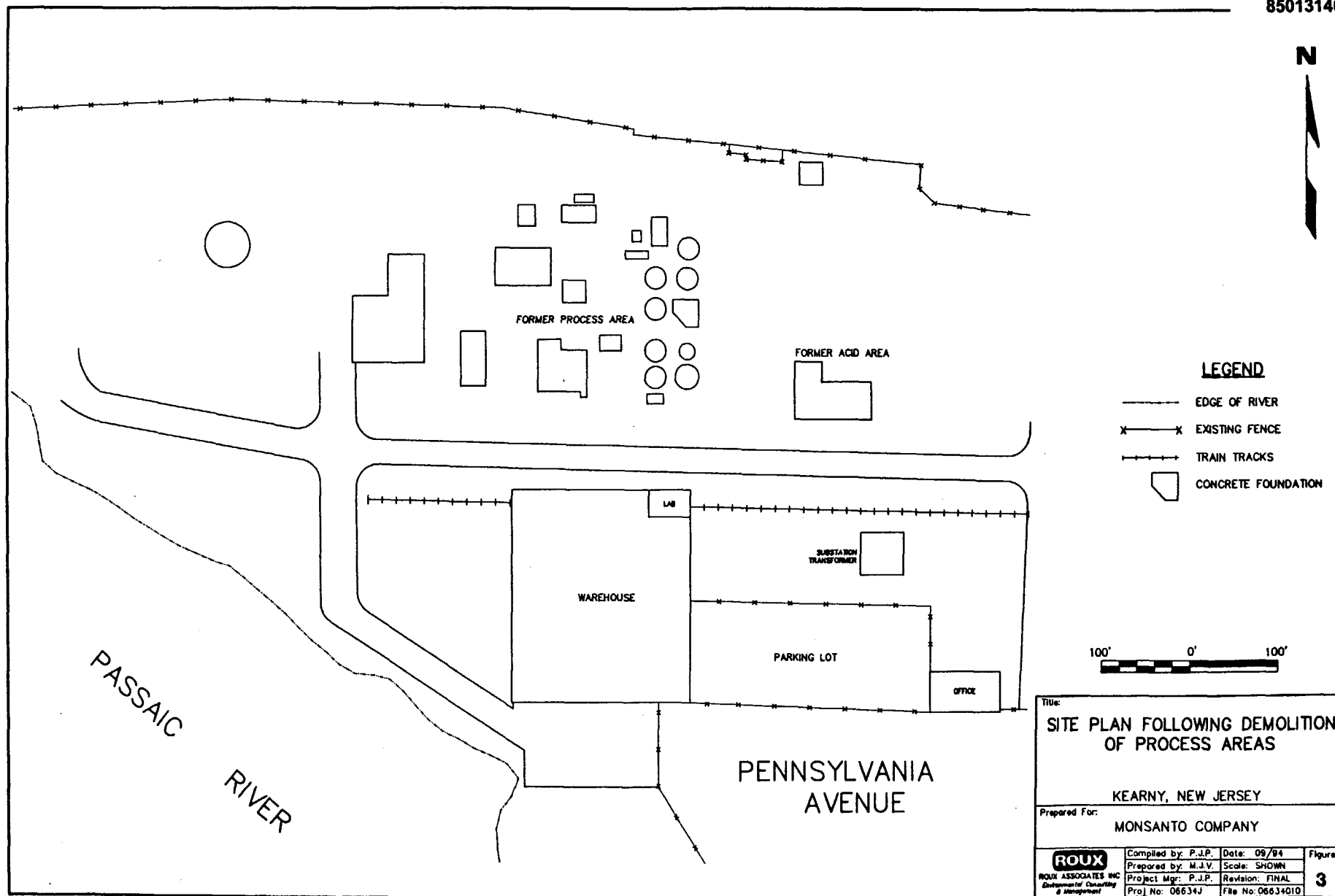
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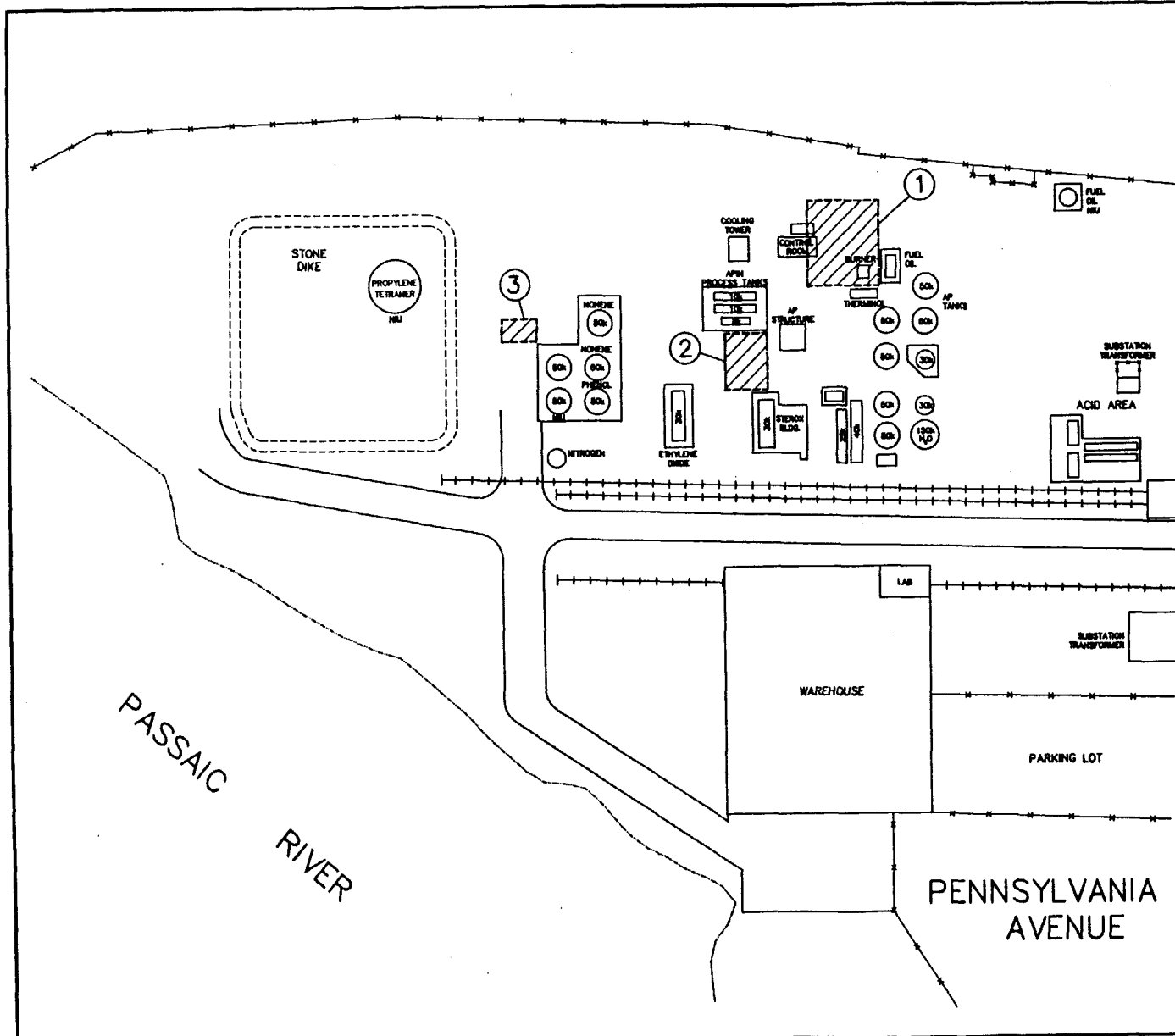
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N





Title:

SITE PLAN SHOWING
AREAS OF CONCERN

KEARNY, NEW JERSEY

Prepared For:

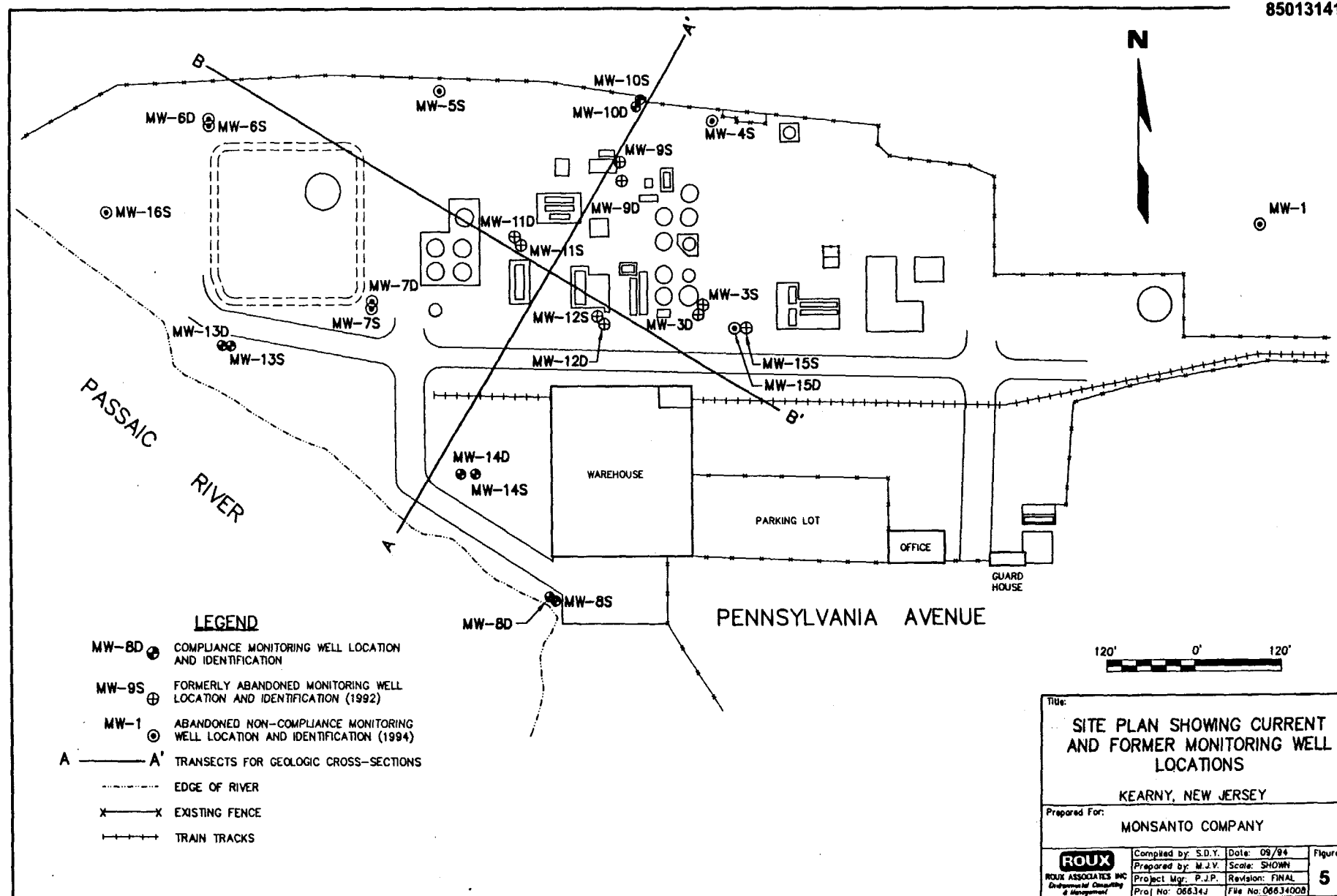
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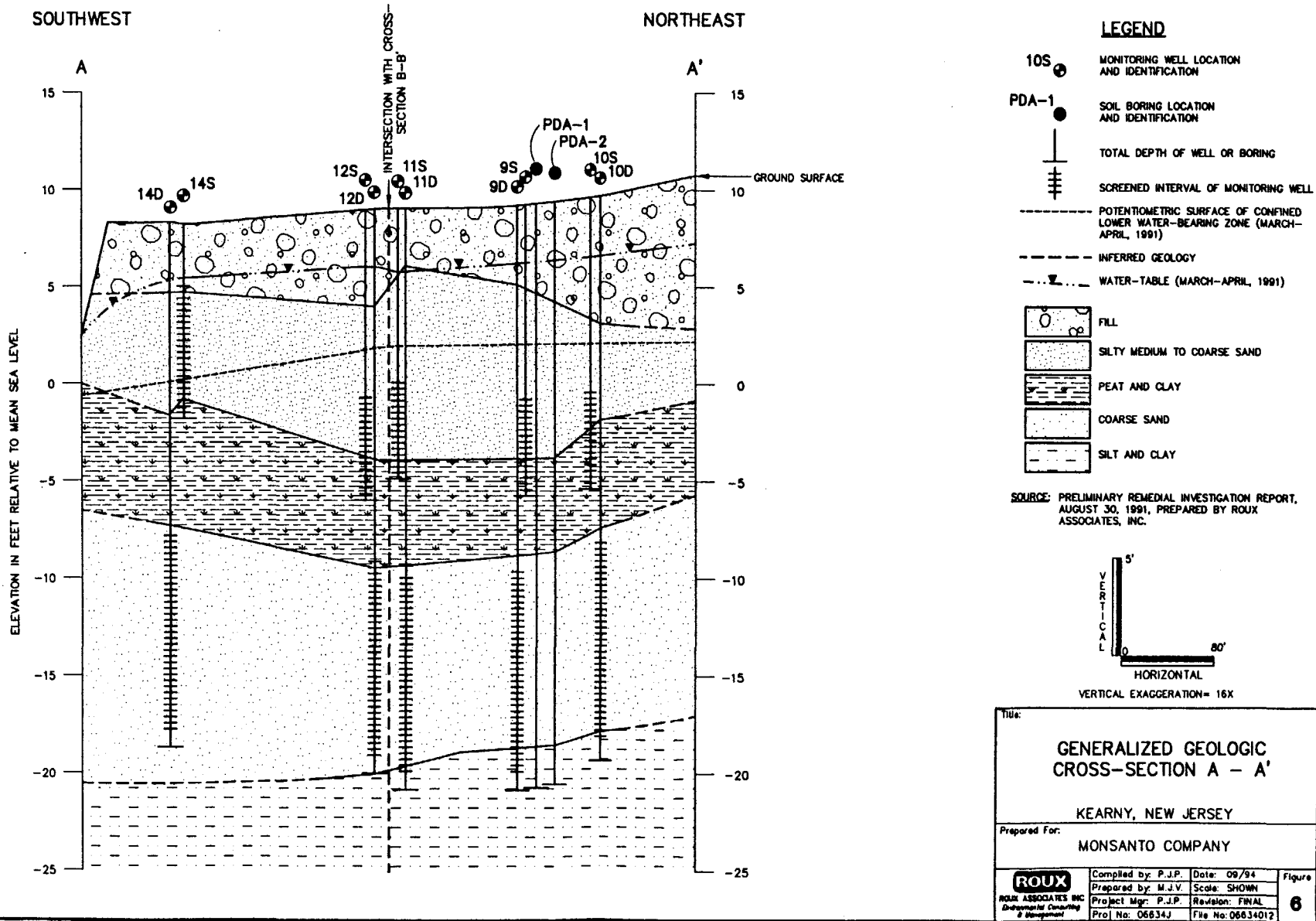
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Environmental Consulting
& Management

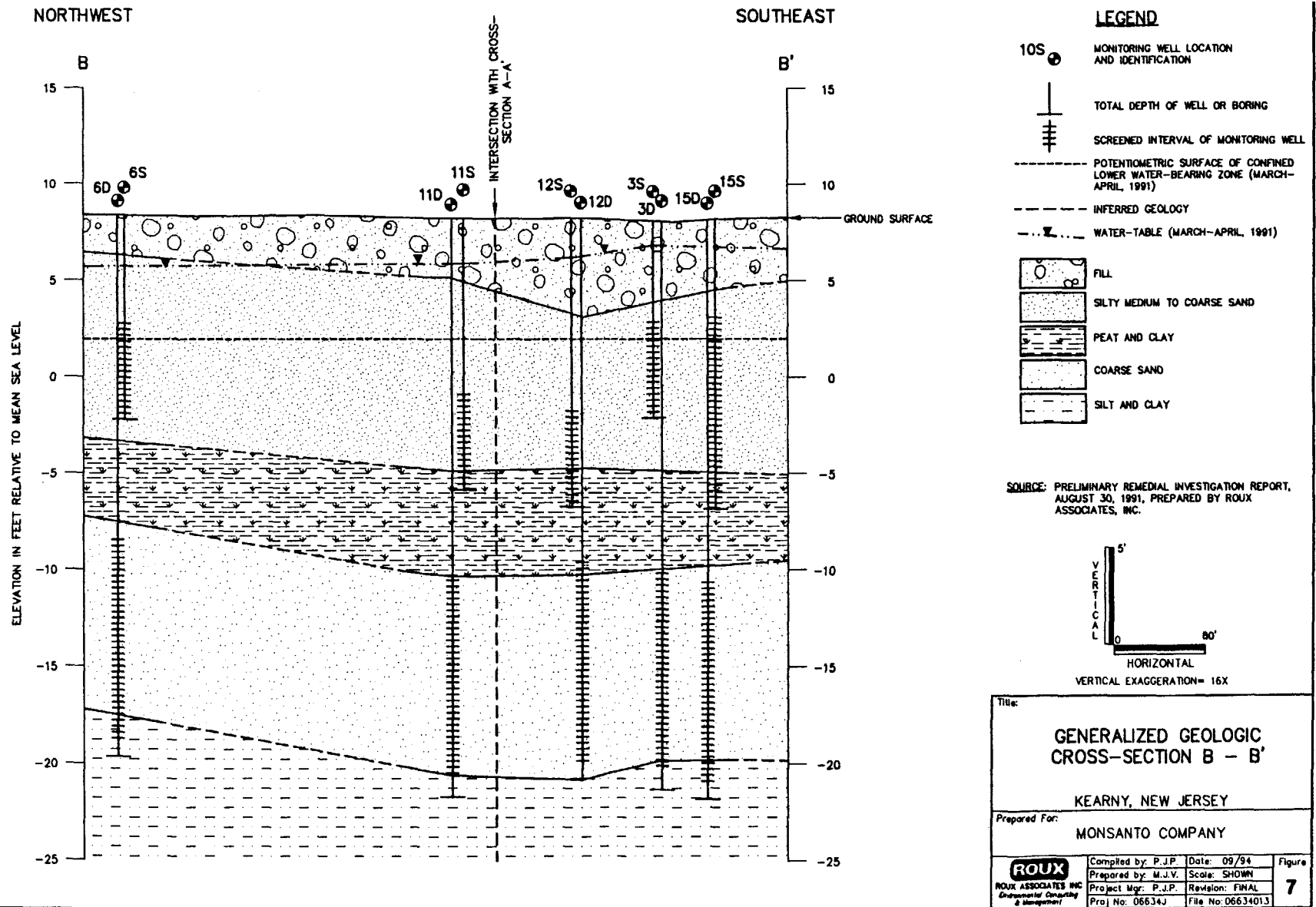
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Prepared by: M.J.V. Scale: SHOWN
Project Mgr: P.J.P. Revision: FINAL
Proj No: 06634J File No: 06634011

Figure

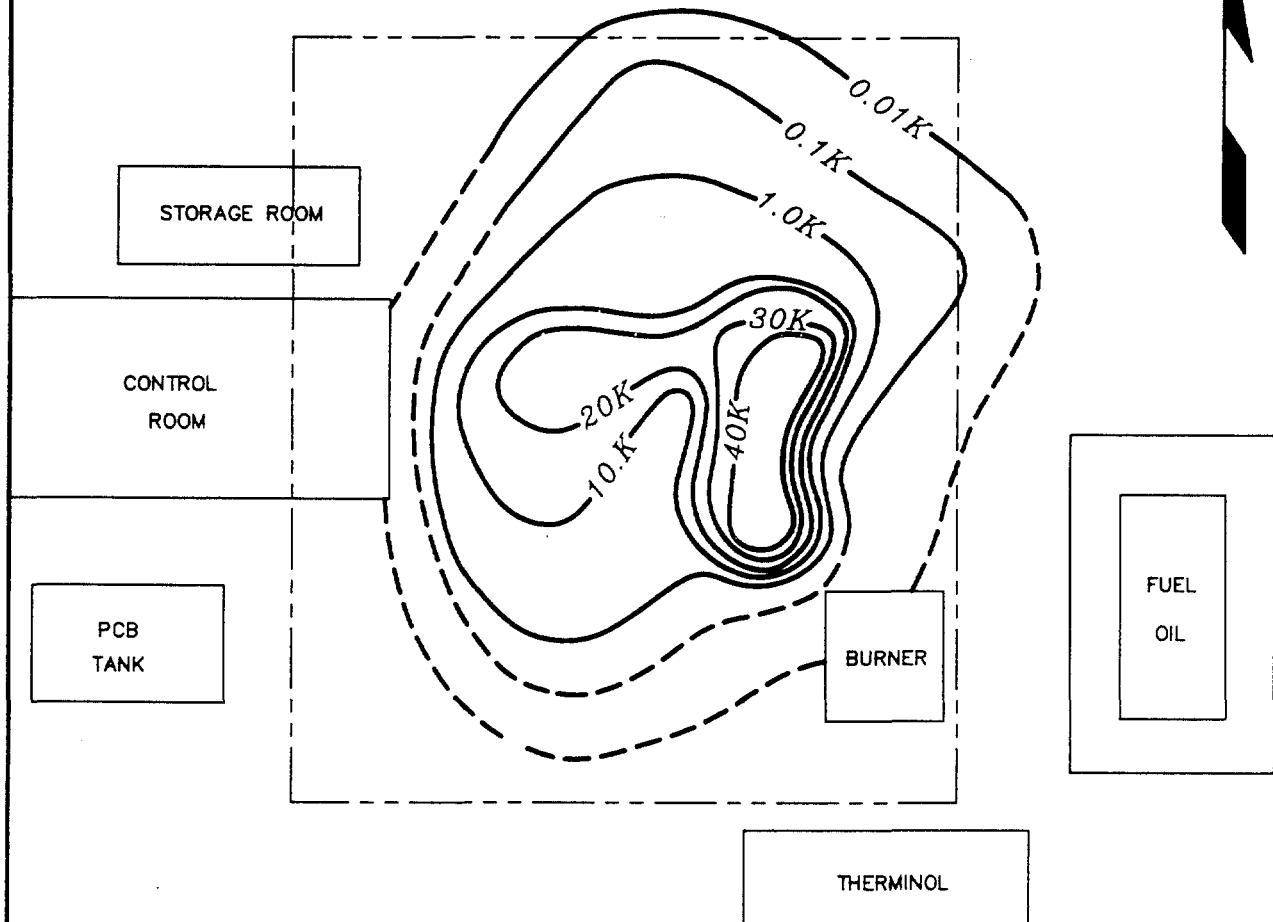
4







N

**LEGEND**

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 2 TO 4 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

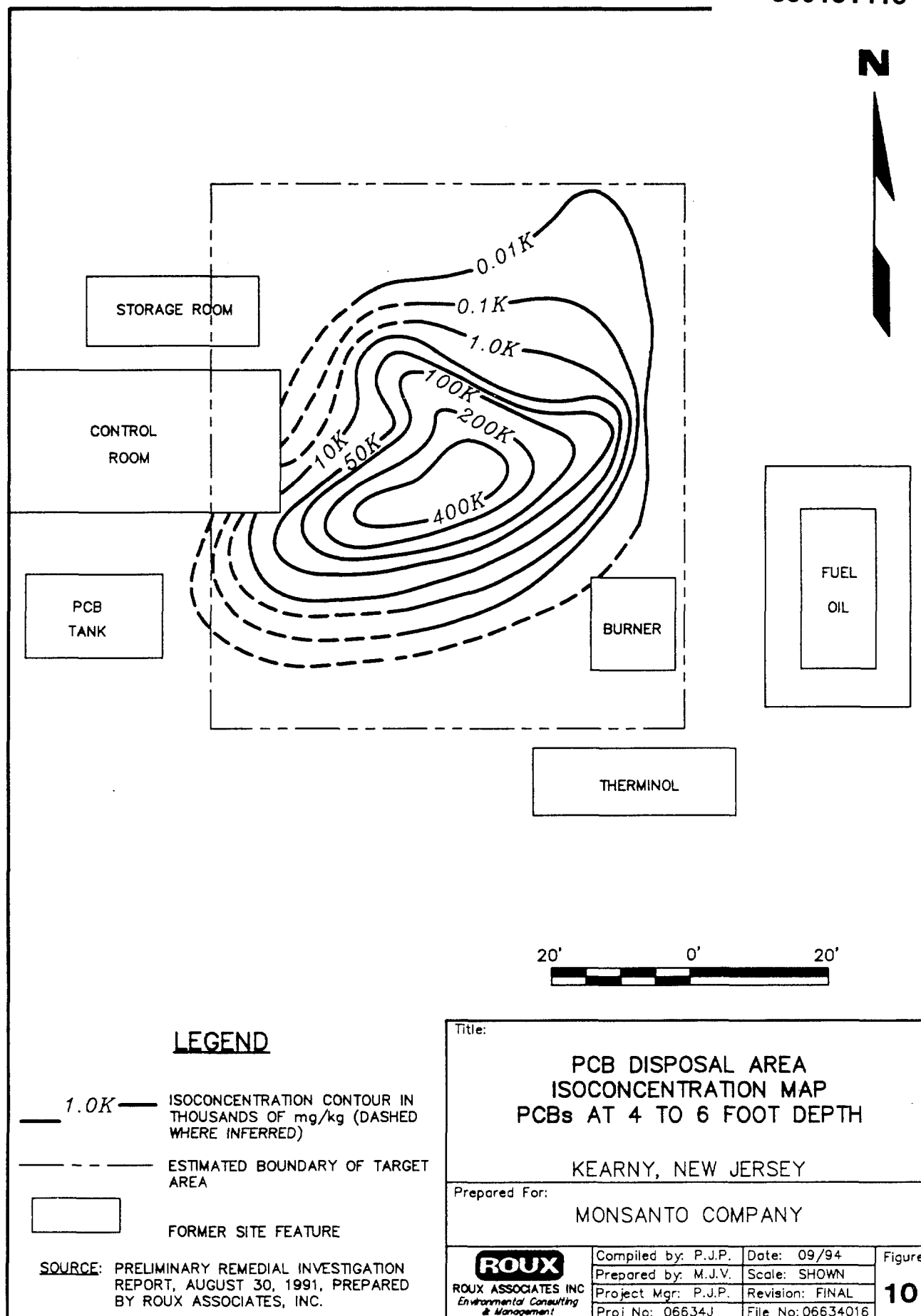
MONSANTO COMPANY

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ROUX ASSOCIATES INC
Environmental Consulting
& Management

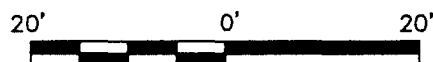
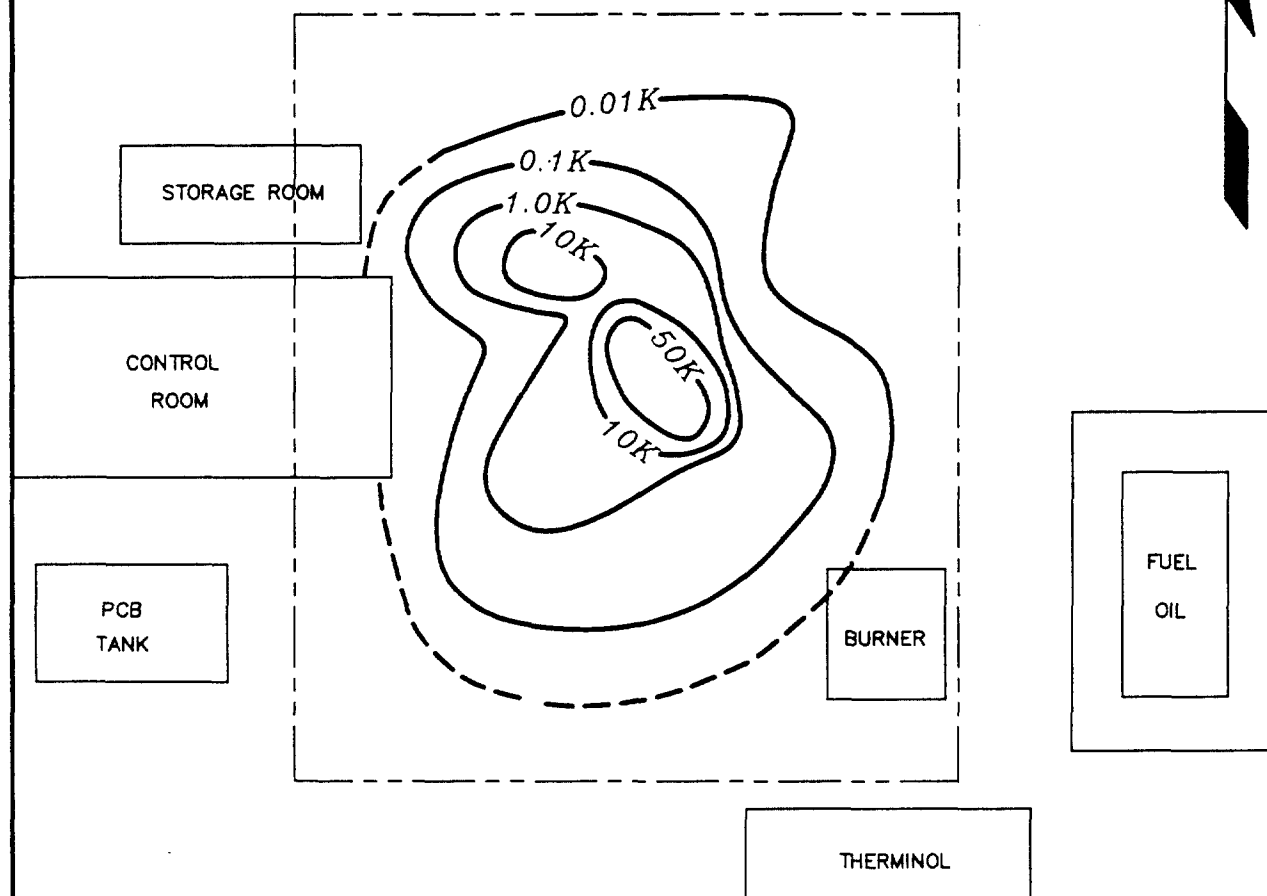
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| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634015 |

Figure

9



N

**LEGEND**

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 6 TO 8 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

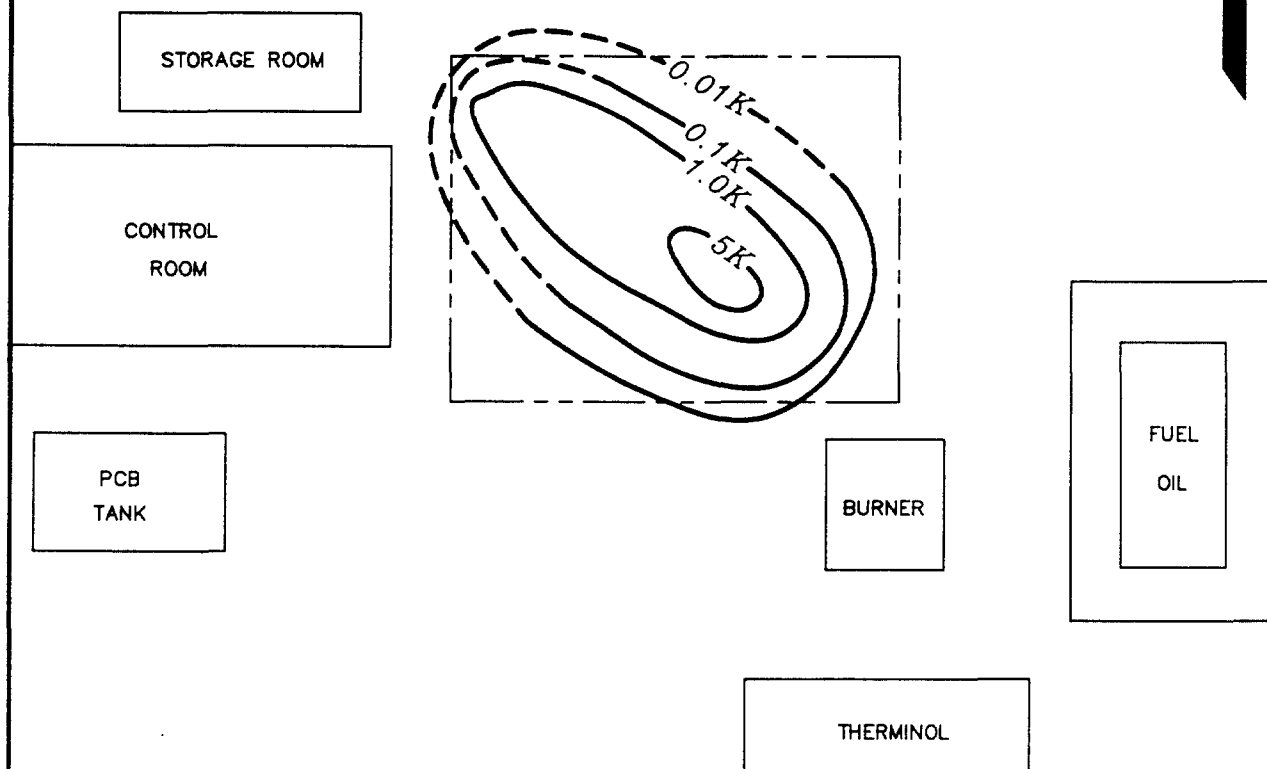
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| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634017 |

Figure

11

N



20' 0' 20'

LEGEND

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 8 TO 10 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

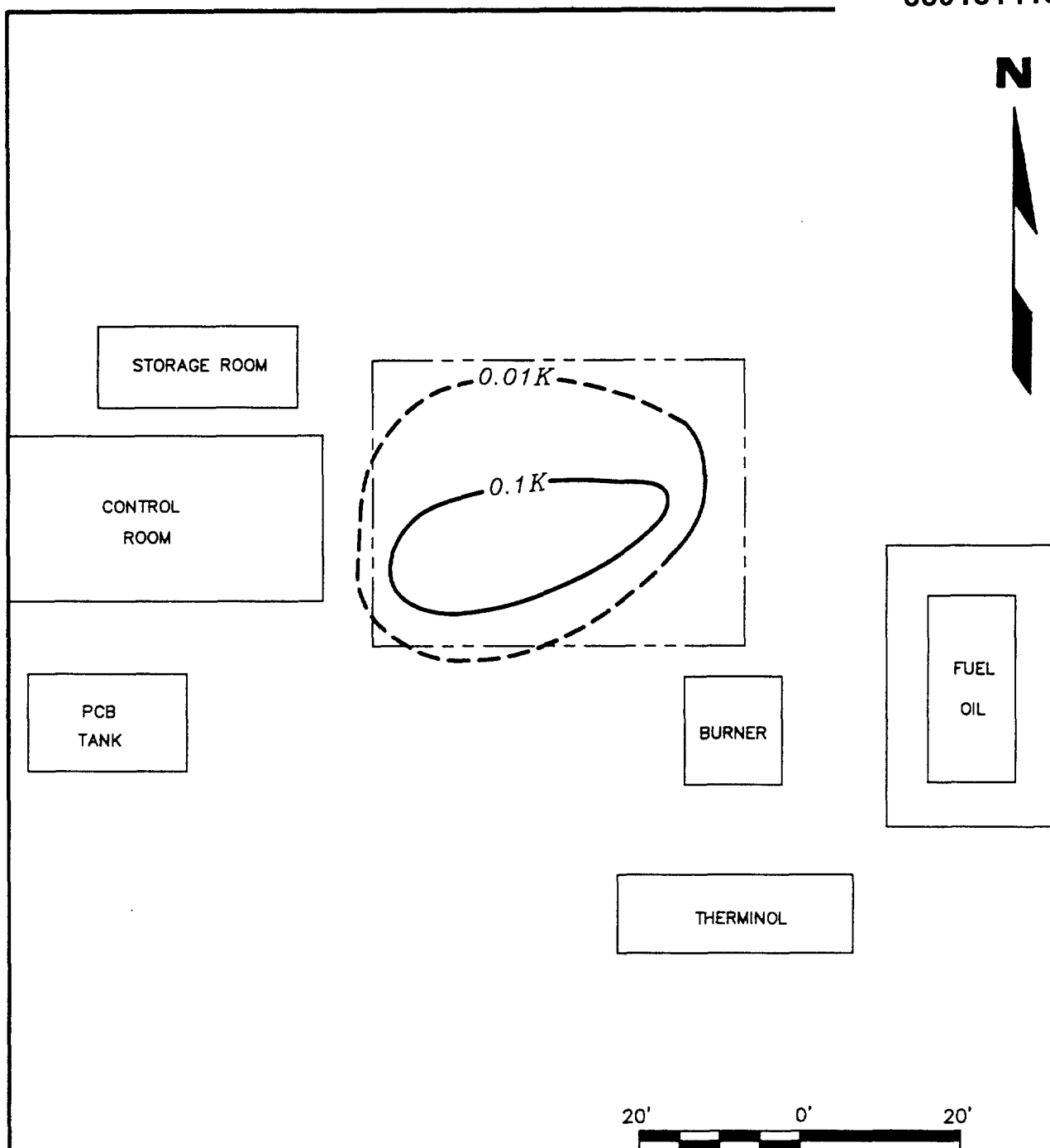
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| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634018 |

Figure

12

N

**LEGEND**

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- — — ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 10 TO 12 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: P.J.P.

Date: 09/94

Figure

Prepared by: M.J.V.

Scale: SHOWN

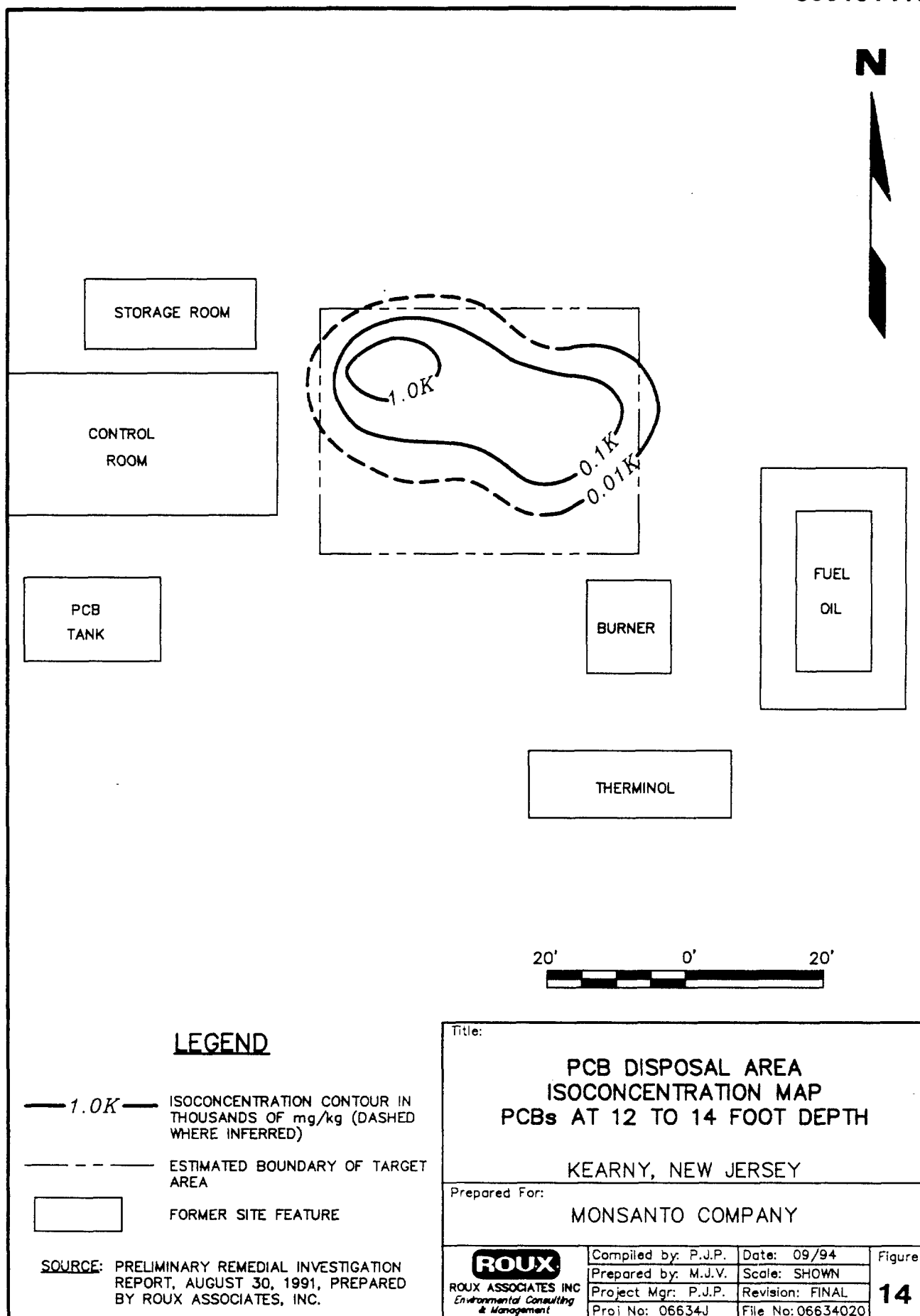
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Revision: FINAL

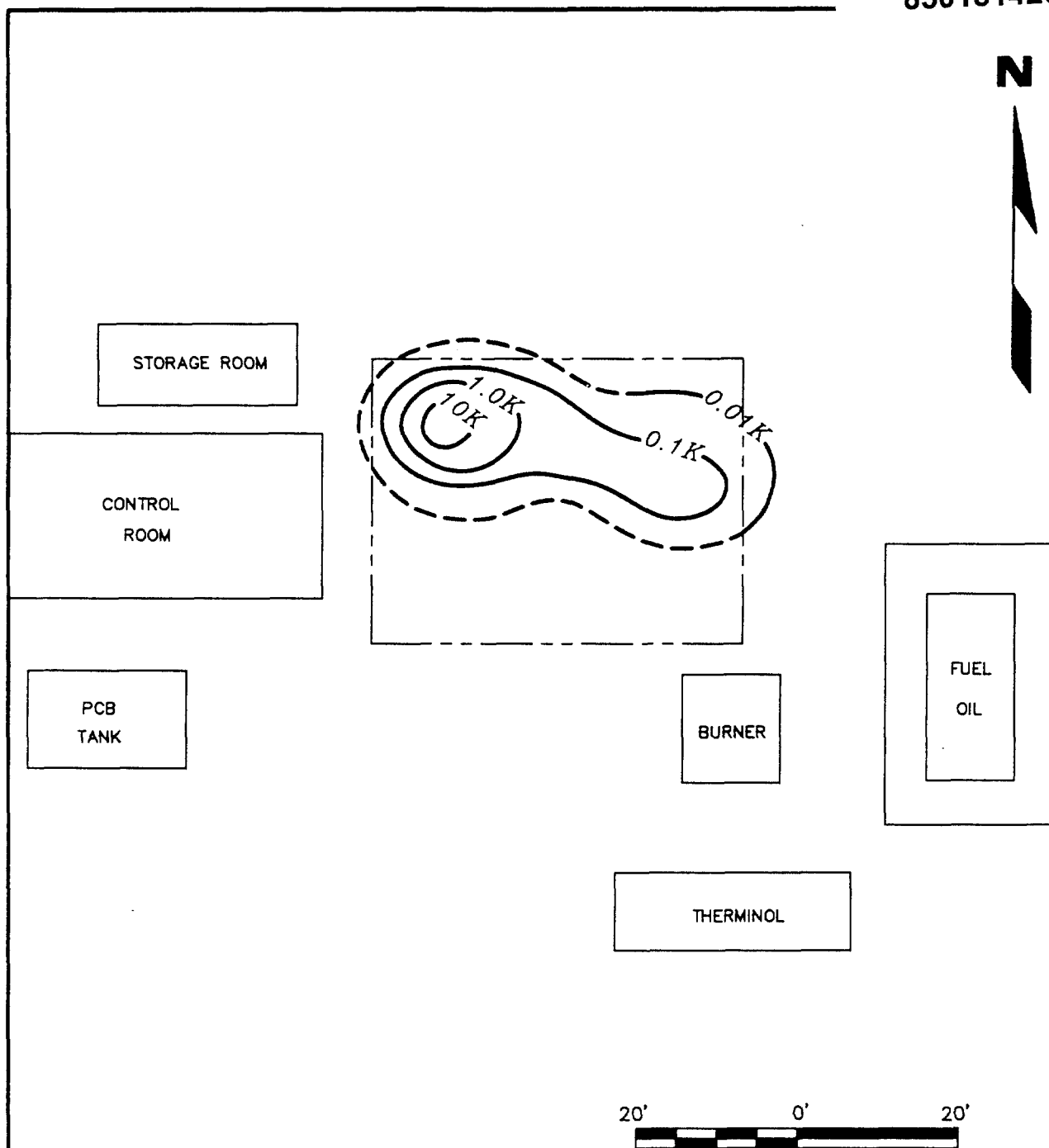
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File No: 06634019

13



N

**LEGEND**

- 1.0K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 14 TO 16 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

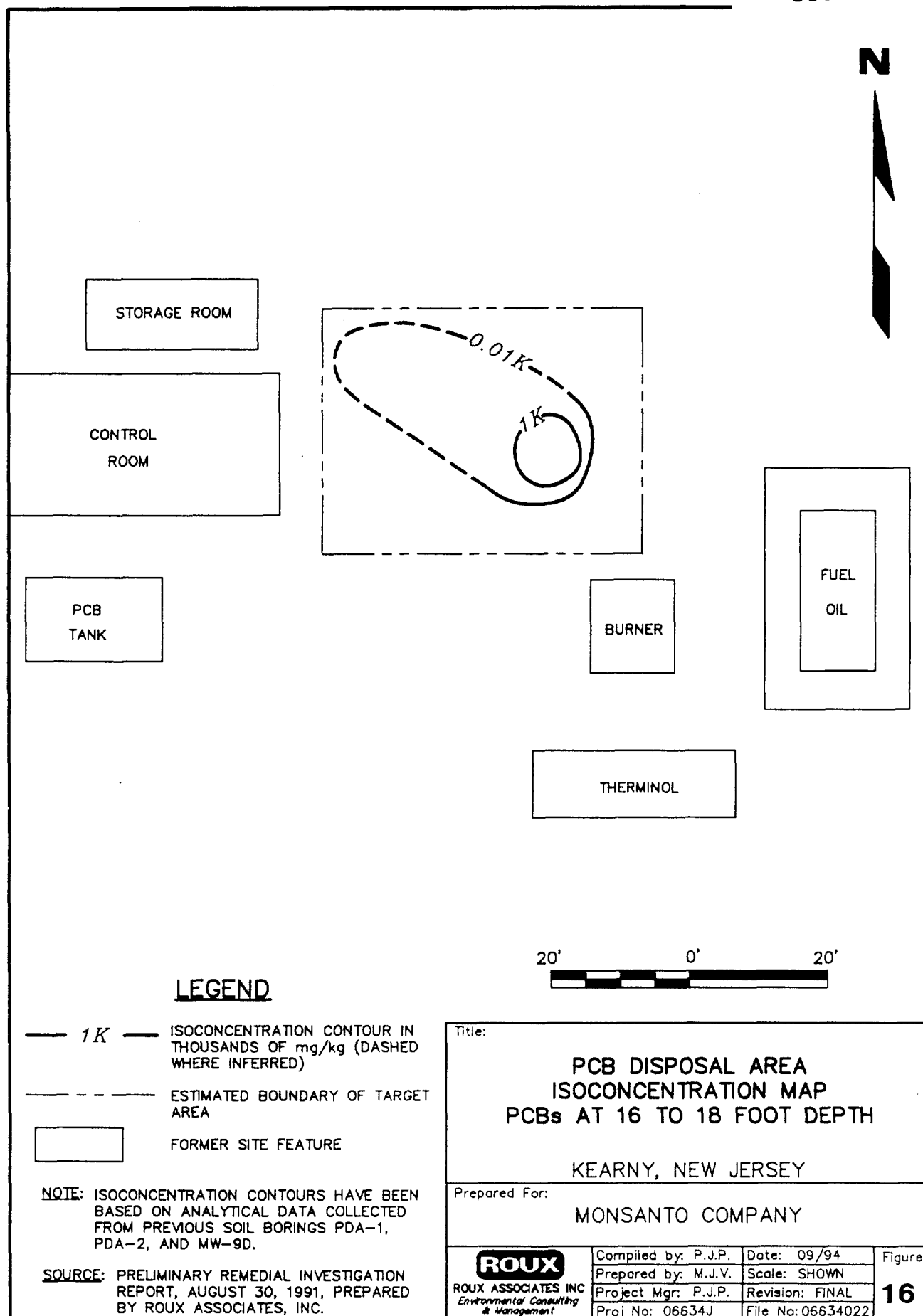
MONSANTO COMPANY

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Environmental Consulting
& Management

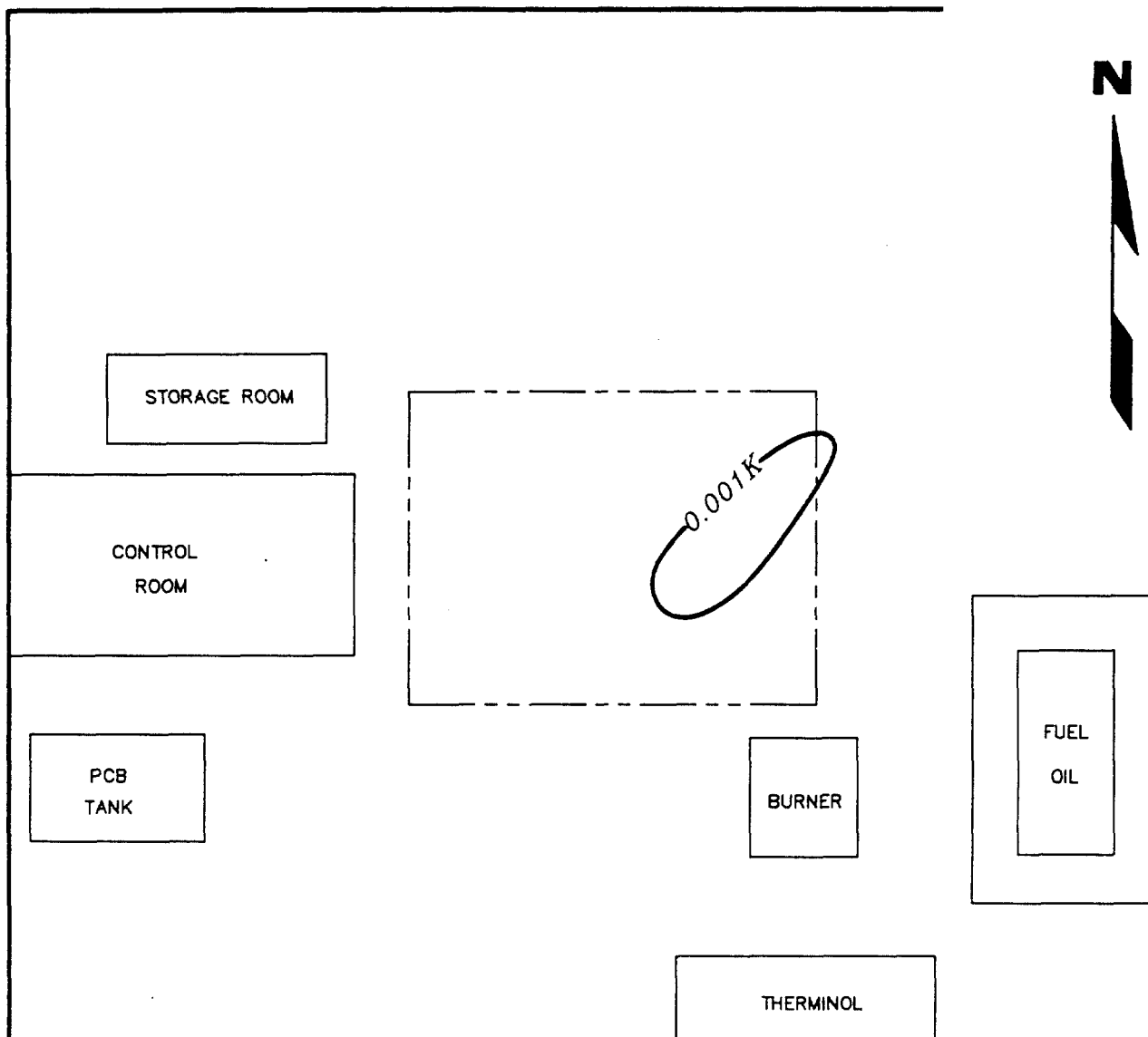
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|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634021 |

Figure

15



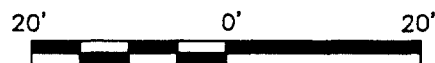
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**LEGEND**

- 0.001K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- — — — — ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.



Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 18 TO 20 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX

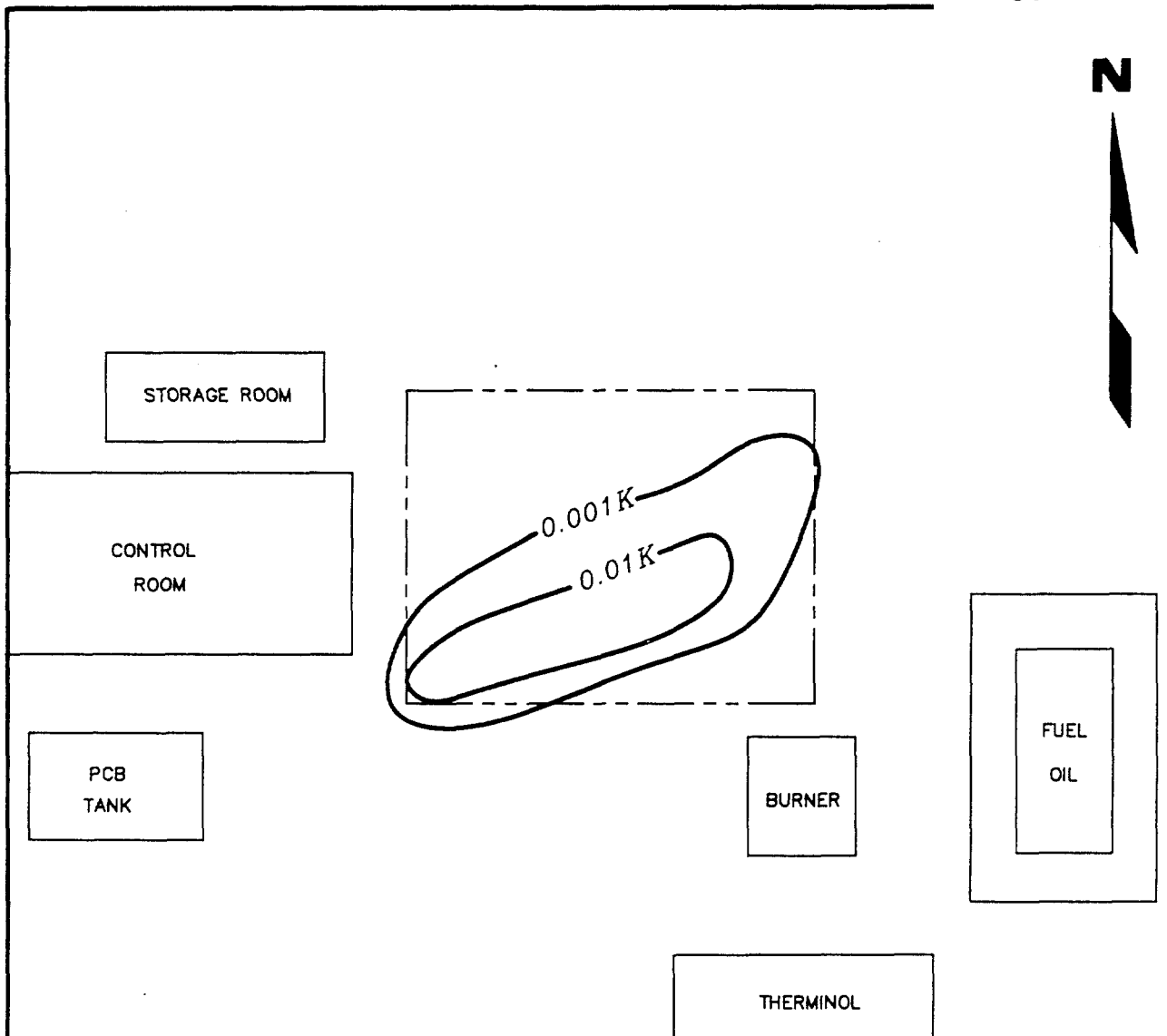
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| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634023 |

Figure

17

N

**LEGEND**

- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- - - - - ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

20' 0' 20'

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 20 TO 22 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

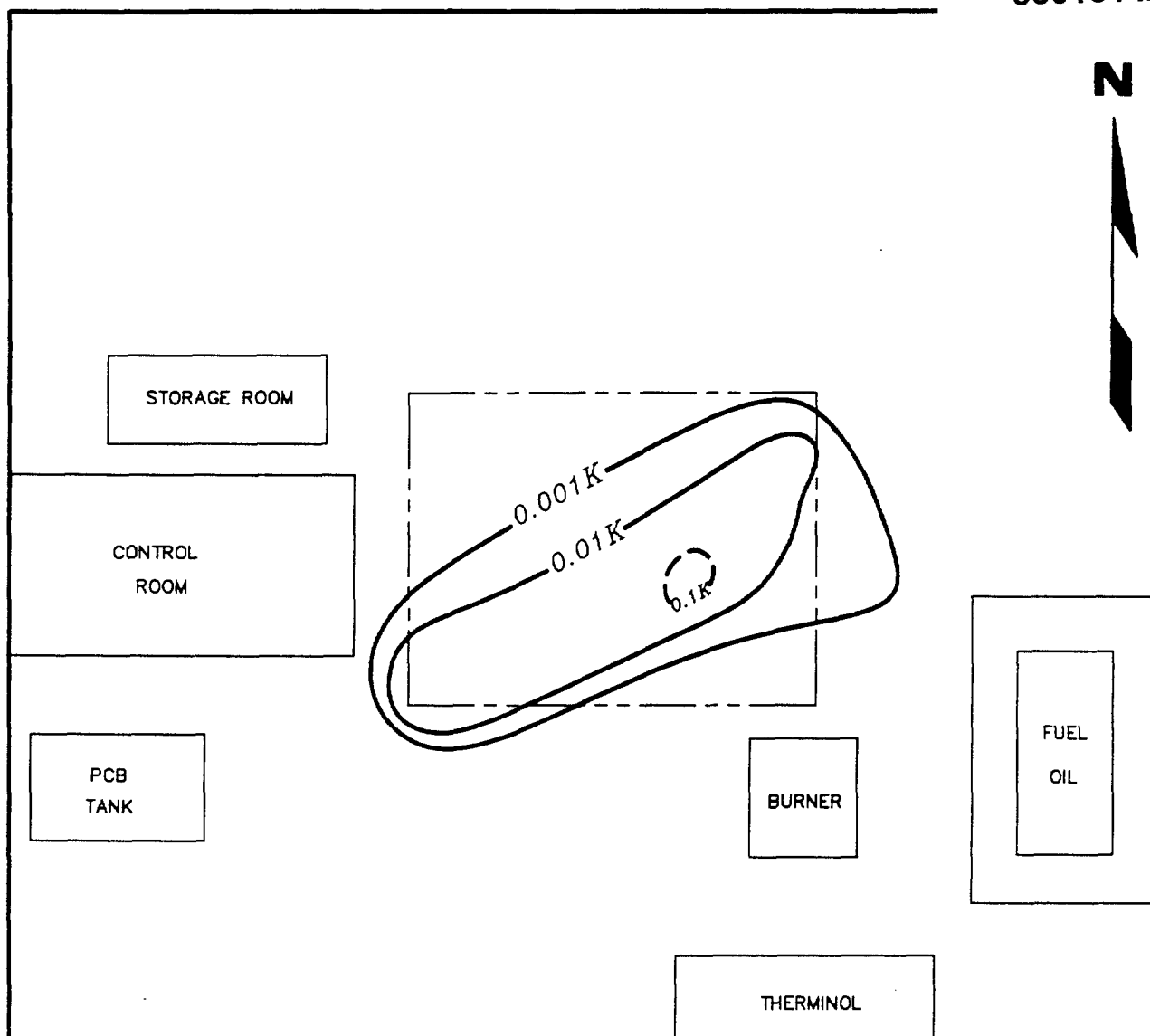
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Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634024 |

Figure

18

N



LEGEND

- 0.1K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- — — ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

20' 0' 20'

Title:

PCB DISPOSAL AREA ISOCONCENTRATION MAP PCBs AT 22 TO 24 FOOT DEPTH

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

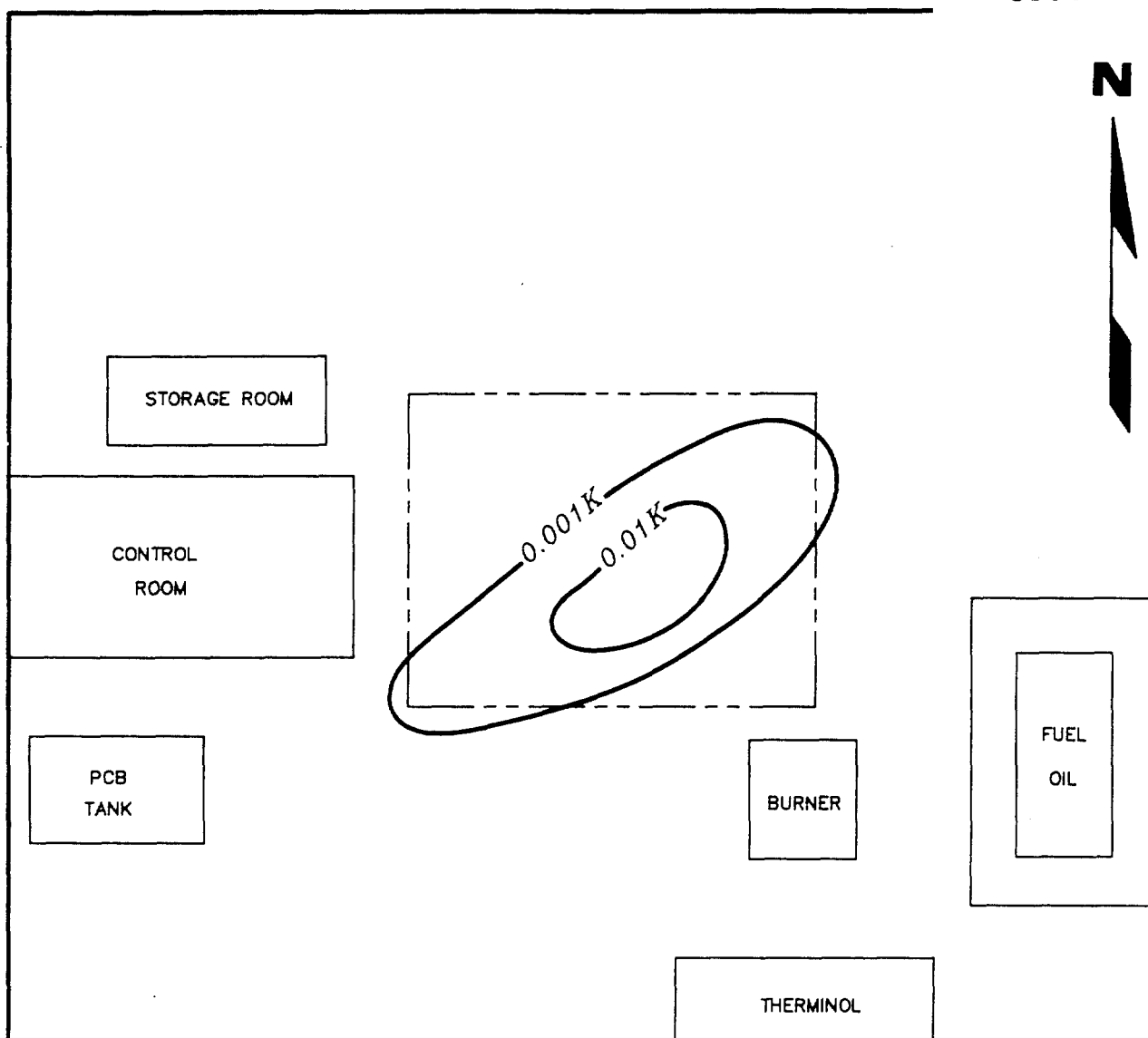
ROUX
ROUX ASSOCIATES INC
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| | |
|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634025 |

Figure

19

N

**LEGEND**

- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.

20' 0' 20'

Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 24 TO 26 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

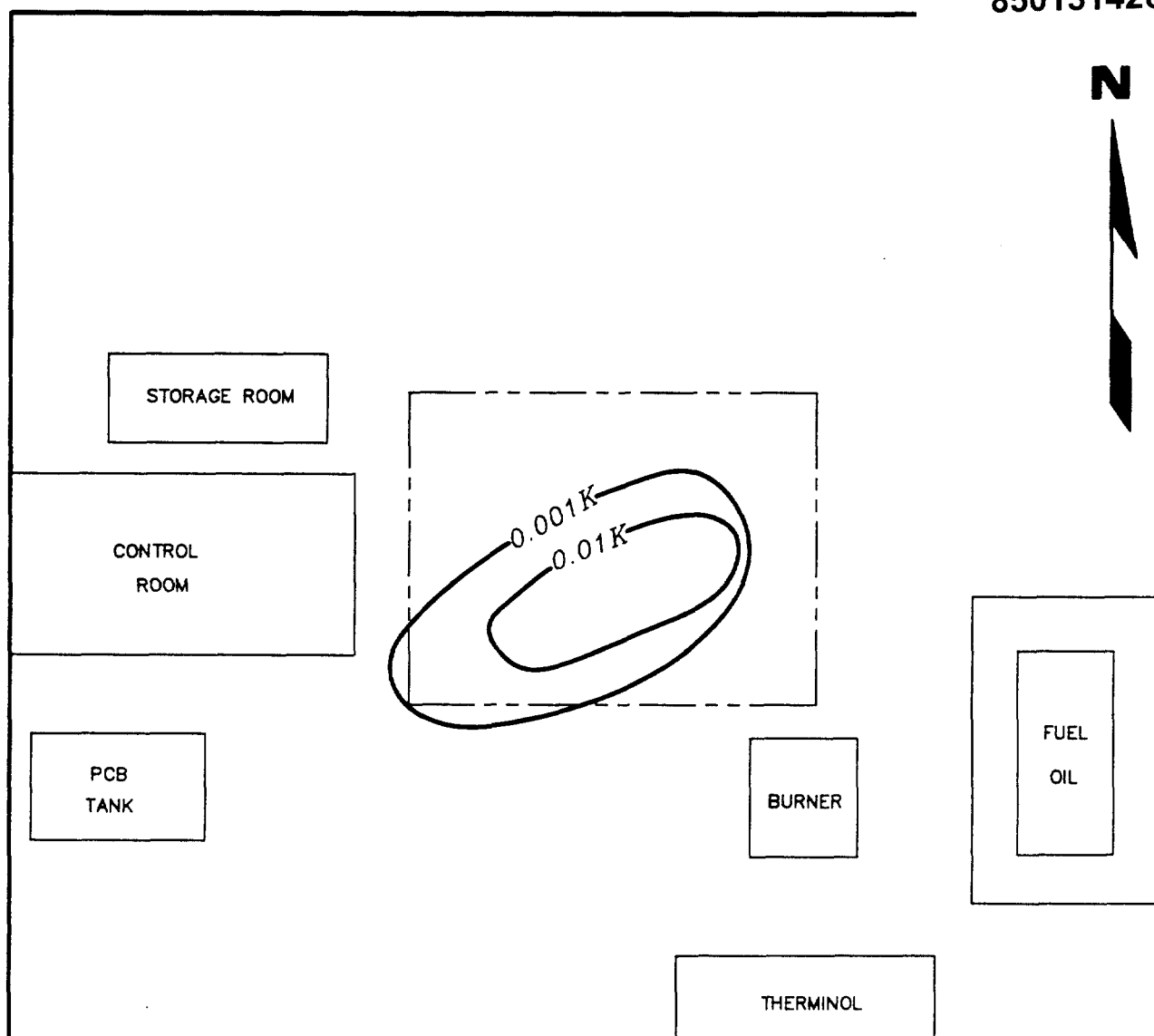
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634026 |

Figure

20

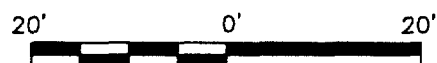
N

**LEGEND**

- 0.01K — ISOCONCENTRATION CONTOUR IN THOUSANDS OF mg/kg (DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET AREA
- FORMER SITE FEATURE

NOTE: ISOCONCENTRATION CONTOURS HAVE BEEN BASED ON ANALYTICAL DATA COLLECTED FROM PREVIOUS SOIL BORINGS PDA-1, PDA-2, AND MW-9D.

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION REPORT, AUGUST 30, 1991, PREPARED BY ROUX ASSOCIATES, INC.



Title:

**PCB DISPOSAL AREA
ISOCONCENTRATION MAP
PCBs AT 26 TO 28 FOOT DEPTH**

KEARNY, NEW JERSEY

Prepared For:

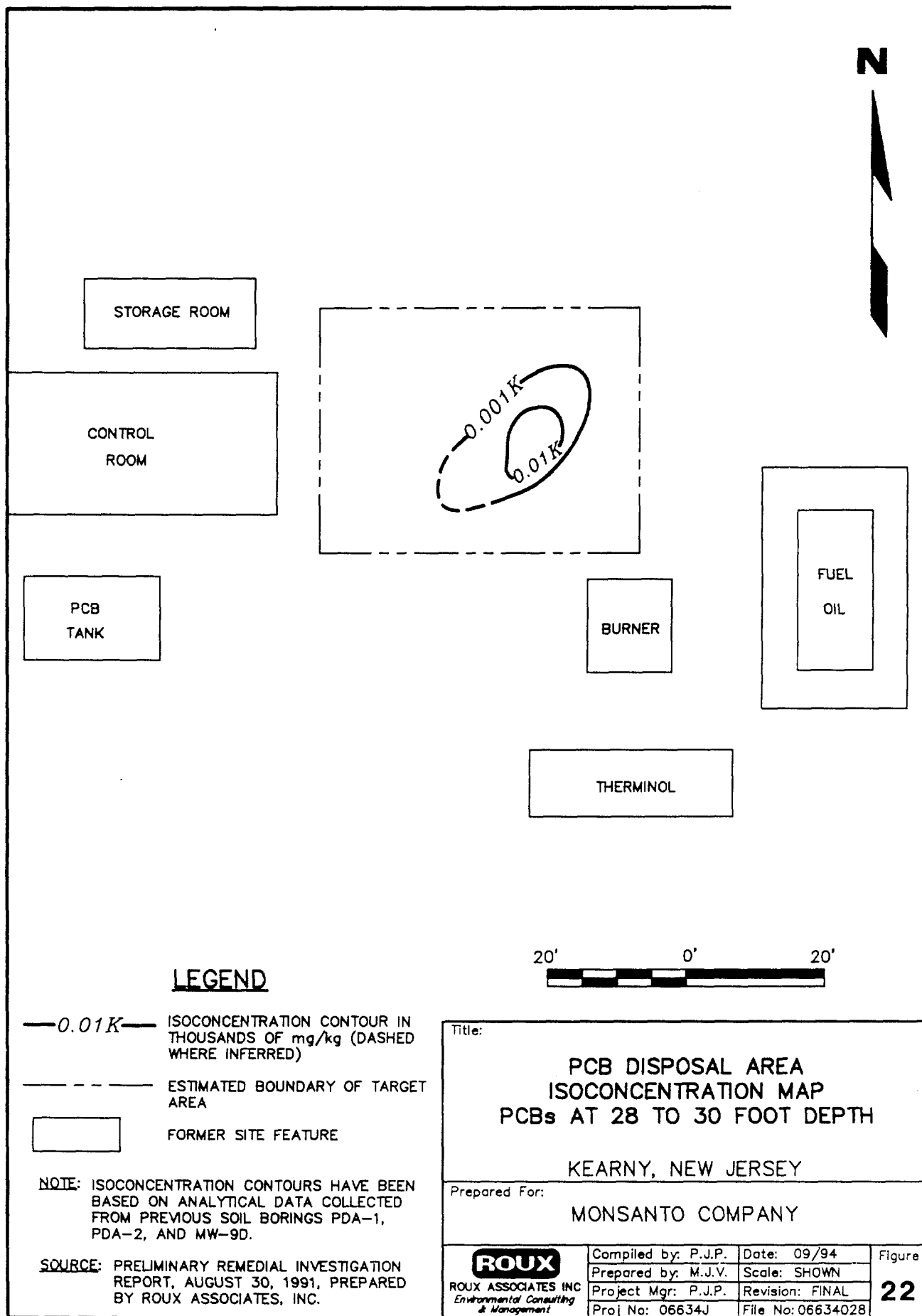
MONSANTO COMPANY

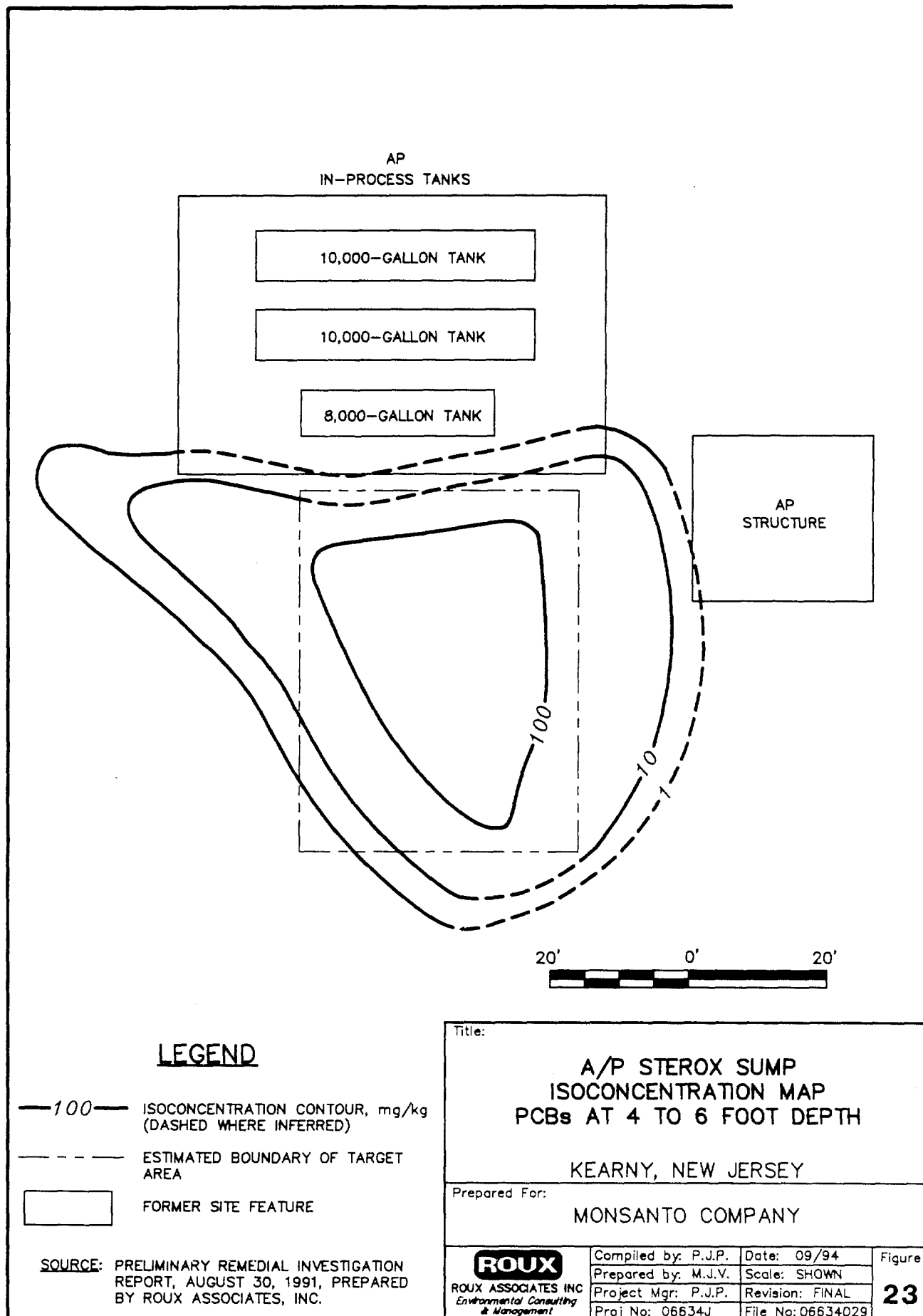
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

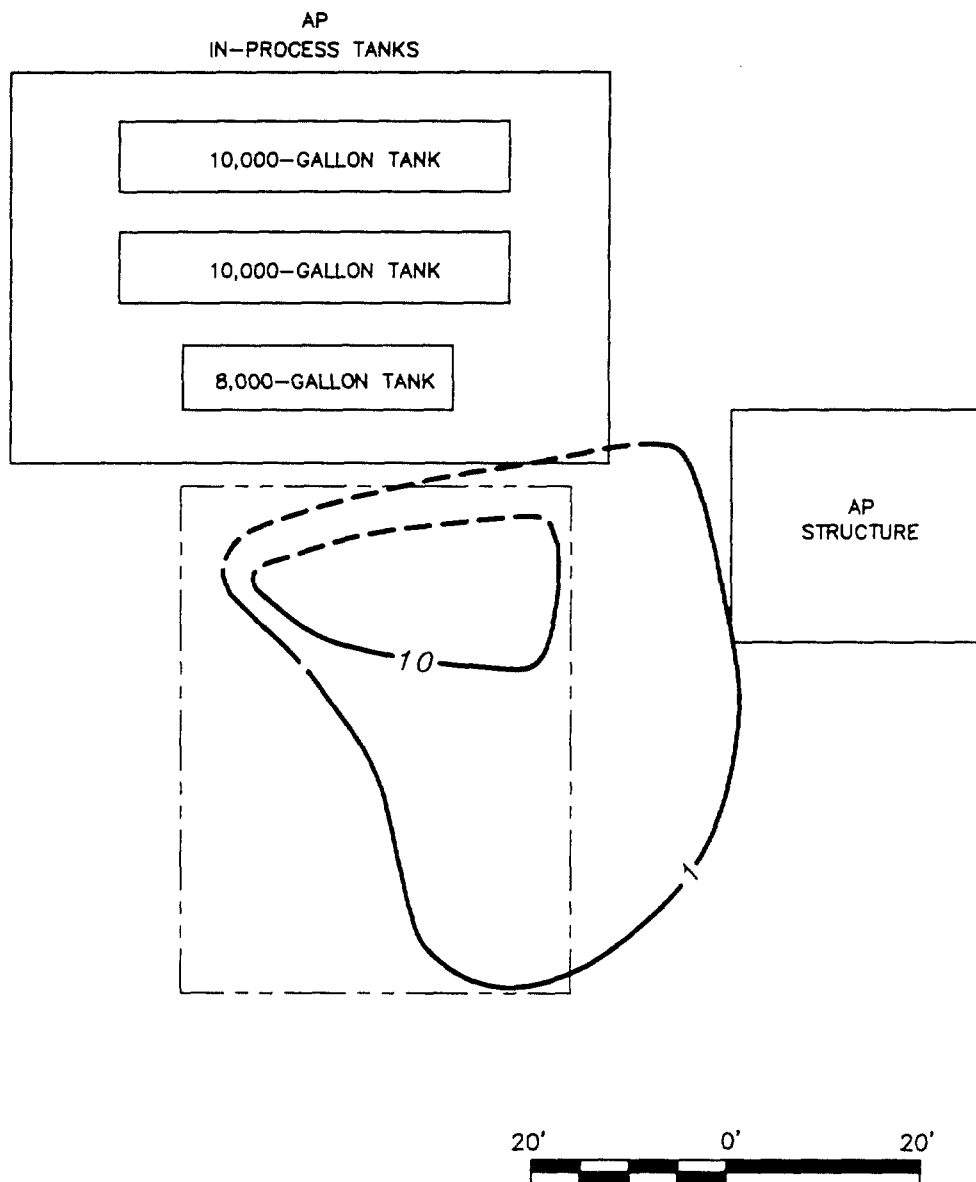
| | |
|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634027 |

Figure

21







LEGEND

- 10 — ISOCONCENTRATION CONTOUR, mg/kg
(DASHED WHERE INFERRED)
- ESTIMATED BOUNDARY OF TARGET
AREA
- FORMER SITE FEATURE

SOURCE: PRELIMINARY REMEDIAL INVESTIGATION
REPORT, AUGUST 30, 1991, PREPARED
BY ROUX ASSOCIATES, INC.

Title:

A/P STEROX SUMP ISOCONCENTRATION MAP PCBs AT 9 TO 11 FOOT DEPTH

KEARNY, NEW JERSEY

Prepared For:

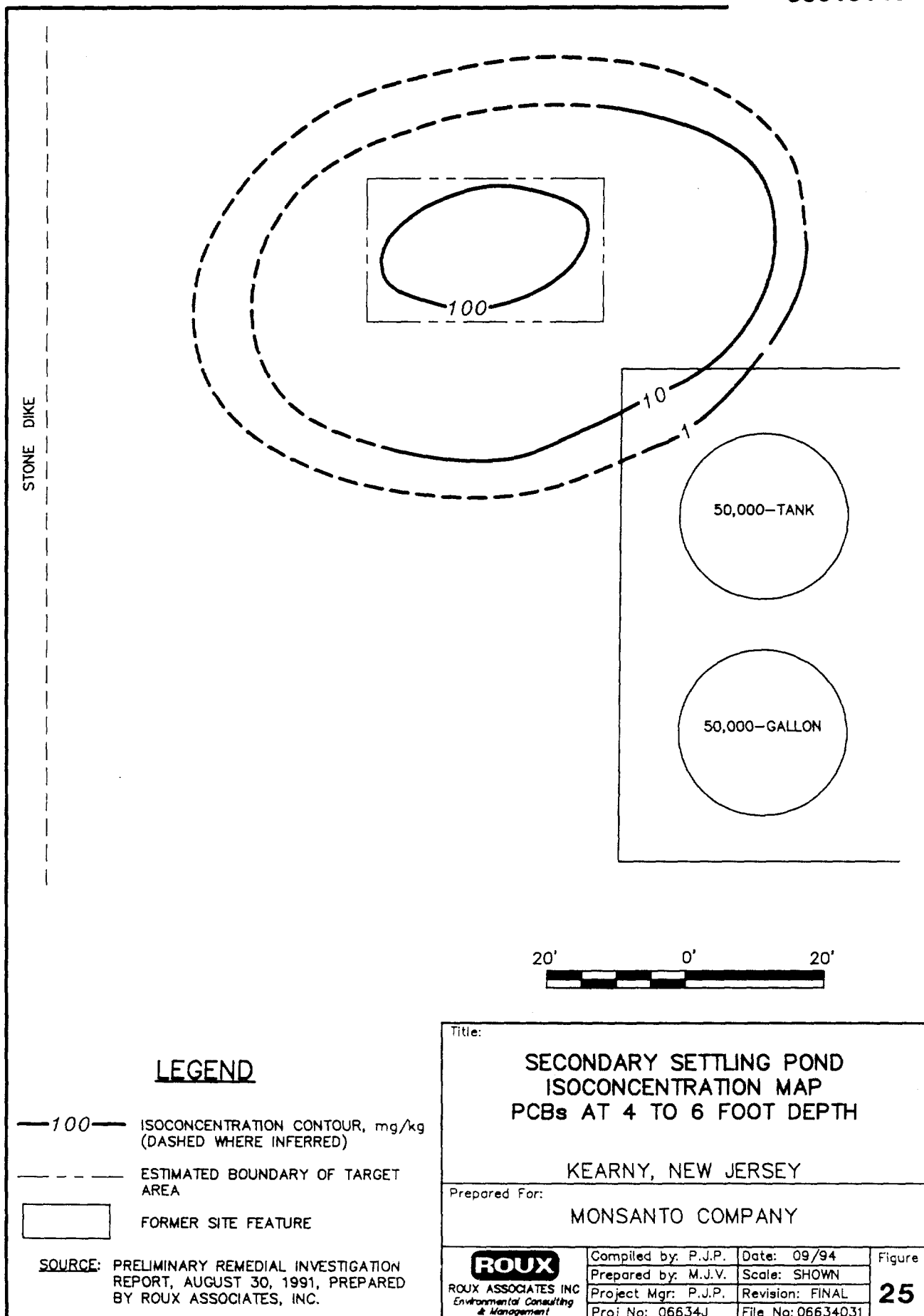
MONSANTO COMPANY

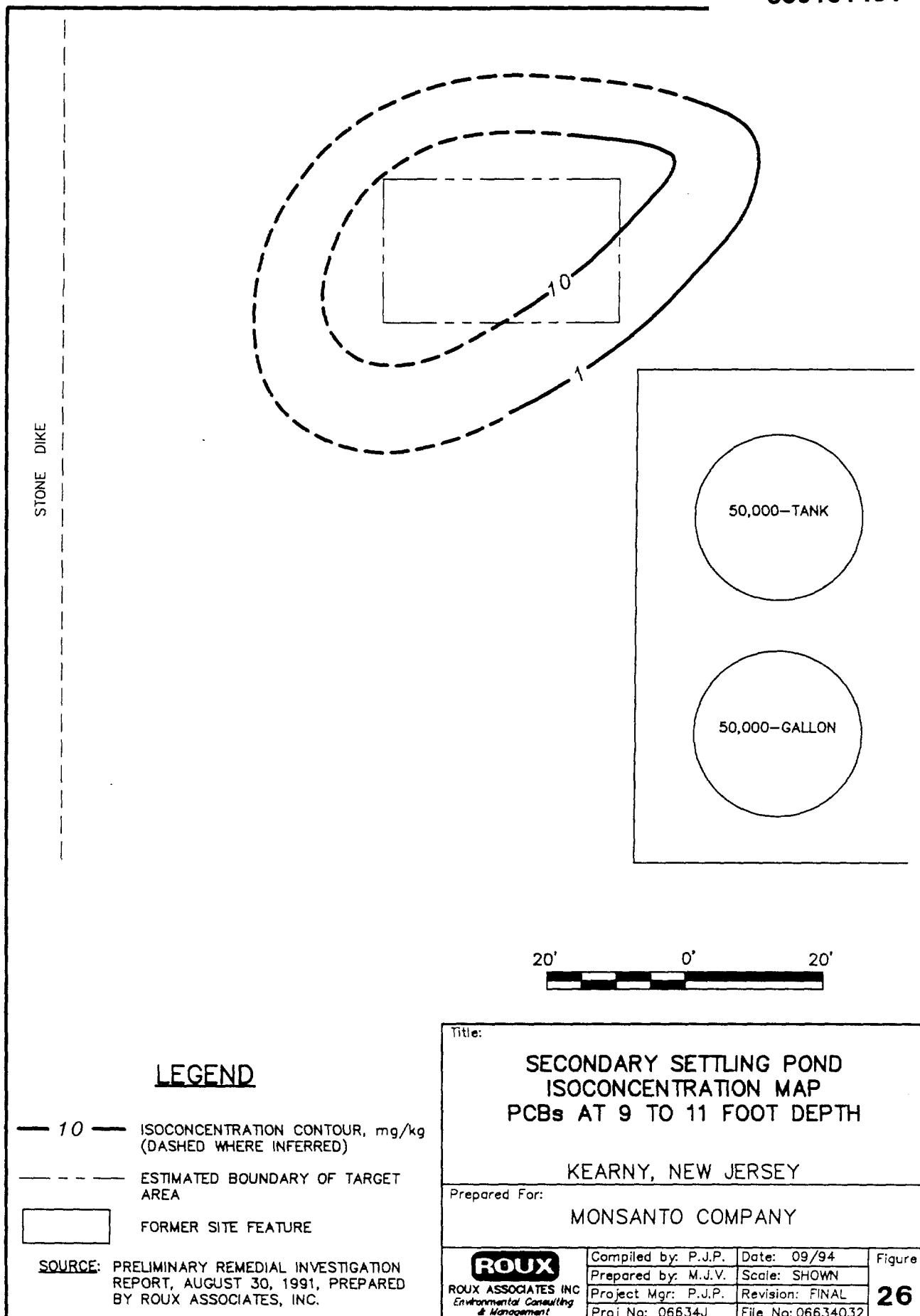
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

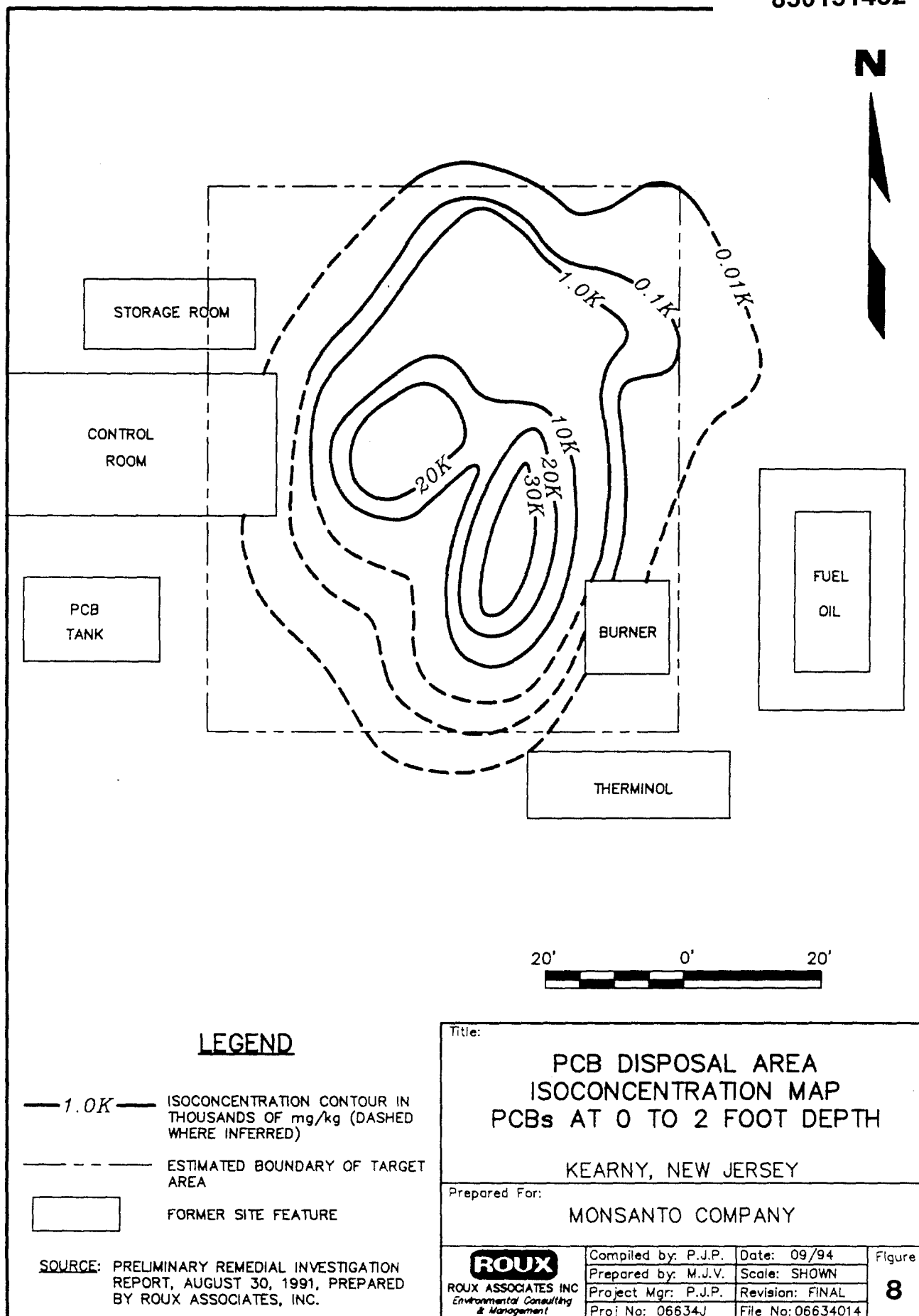
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|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 09/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634030 |

Figure

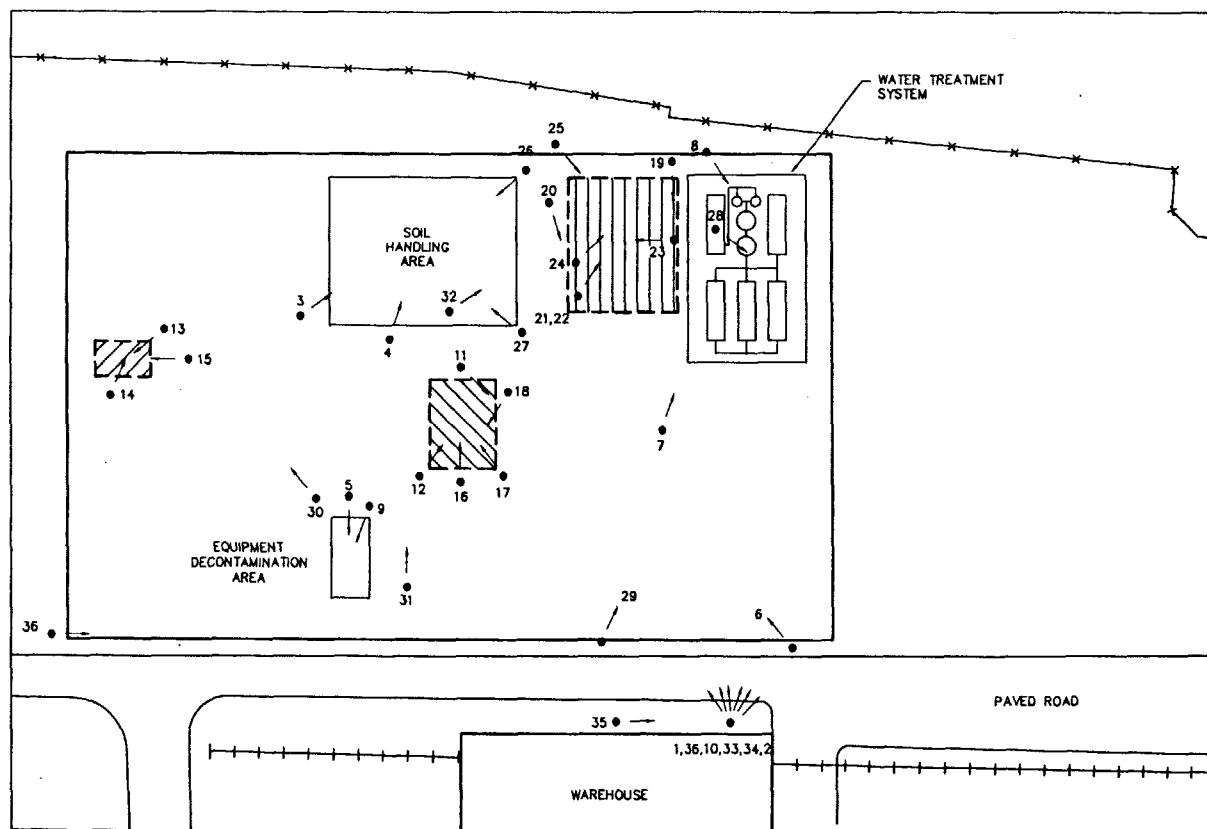
24







N

**LEGEND**

1. — PHOTOGRAPH LOCATION, DIRECTION AND IDENTIFICATION
- SECONDARY SETTLING POND (SSP)
- AP/STEROX SUMP (APSS)
- PCB DISPOSAL AREA (PDA)
- X — X EXISTING FENCE
- — — — — TRAIN TRACKS
- APPROXIMATE LOCATION OF ASPHALT CAP AREA

| | | | |
|---------------------------------------------------------------------------------|---------------------|-------------------|-----------|
| Title: | | | |
| LOCATION OF PHOTOGRAPHS | | | |
| KEARNY, NEW JERSEY | | | |
| Prepared For: | | | |
| MONSANTO COMPANY | | | |
| ROUX
ROUX ASSOCIATES INC.
Environmental Consulting
& Management | Compiled by: A.R.S. | Date: 10/94 | Figure |
| | Prepared by: M.J.V. | Scale: N.T.S. | |
| | Project Mgr: P.J.P. | Revision: FINAL | |
| | Proj No: 06634J | File No: 06634041 | |
| | | | 27 |



MONSANTO COMPANY

ENGINEER/CONSULTANT
(ROUX ASSOCIATES, INC.)

ADMINISTRATION
OF CONTRACT

GENERAL CONTRACTOR
(WESTINGHOUSE REMEDIATION
SERVICES, INC.)

FACILITY
COORDINATION

DISPOSAL FACILITIES
(CHEMICAL WASTE MANAGEMENT, INC.)

PRINCIPAL
MANAGER

PROJECT
MANAGER

SITE PROJECT
MANAGER

SITE HEALTH AND
SAFETY OFFICER

TRANSPORTATION
(CHEMICAL WASTE MANAGEMENT, INC.)

SUBCONTRACTORS

TRANSPORTERS

CONSTRUCTION OVERSIGHT

SITE MANAGER

SUBCONTRACTORS

ENGINEERS

HYDROGEOLOGISTS

GEOLOGISTS

SCIENTISTS

TECHNICIANS

LABORATORY

DATA VALIDATOR

SUBCONTRACTORS/
SUPPLIERS

SURVEYING

SHEETPIILING

LABORATORY

ASPHALT PAVING

DRILLING

NON-HAZ WASTE
TRANSPORTERS

COMPACTING
TESTING

Title:

PROJECT ORGANIZATION CHART

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: S.D.Y.

Date: 08/94

Figure

Prepared by: M.J.V.

Scale: NONE

Project Mgr: P.J.P.

Revision: FINAL

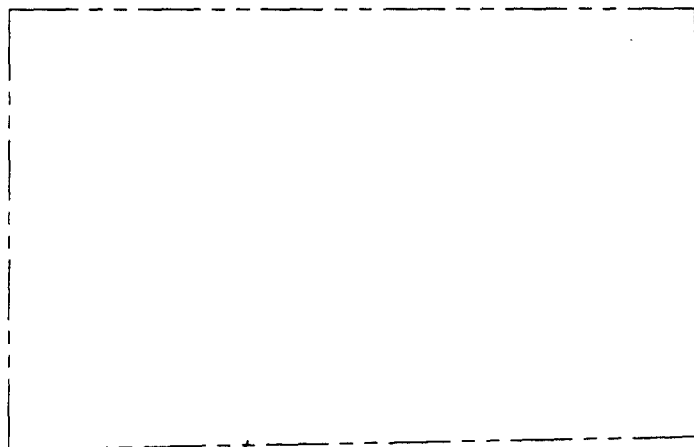
Proj No: 06634J

File No: 06634007

29

850131435

N



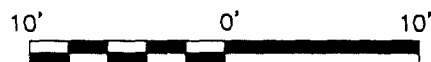
APPROXIMATE VOLUME CALCULATIONS
FOR SURFACE/SUBSURFACE
SOIL REMOVAL

AREA = 799 S.F.

VOLUME = 799 S.F. X 10.3 FT. DEEP

= 8,230 C.F.

= 305 C.Y.



LEGEND

----- ACTUAL BOUNDARY OF TARGET AREA

NOTES:

1. ALL DATA USED IN ABOVE CALCULATIONS WAS DERIVED FROM AS-BUILT DRAWINGS.
2. ACTUAL TONNAGE OF SSP SOIL REMOVED EQUALED 422.50 TONS.

Title:

**AS-BUILT VOLUME CALCULATIONS
FOR SOIL REMOVED IN THE SSP**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

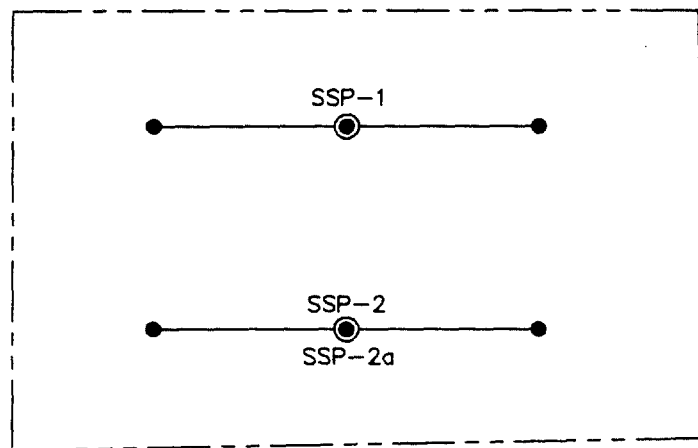
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: A.R.S. | Date: 10/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634044 |

Figure

30

N



AREA = 799 S.F.

TOTAL NO. OF SOIL SAMPLES= 2

TOTAL NO. OF COMPOSITES= 6

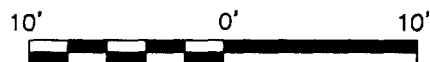
LEGEND



COMPOSITE LOCATION

SOIL SAMPLE LOCATION

----- ACTUAL BOUNDARY OF TARGET AREA



NOTES:

1. POST-EXCAVATION SOIL SAMPLES SSP-1 AND SSP-2 WERE COLLECTED AT 9' BGS ON MAY 31, 1994.
2. POST-EXCAVATION SOIL SAMPLE SSP-2a WAS COLLECTED AT 10.5' BGS ON JUNE 2, 1994.
3. EACH POST-EXCAVATION SOIL SAMPLE WAS OBTAINED FROM A COMPOSITE TAKEN FROM THREE INDIVIDUAL SAMPLING LOCATIONS.

Title:

APPROXIMATE LOCATIONS OF SSP POST-EXCAVATION SOIL SAMPLES

KEARNY, NEW JERSEY

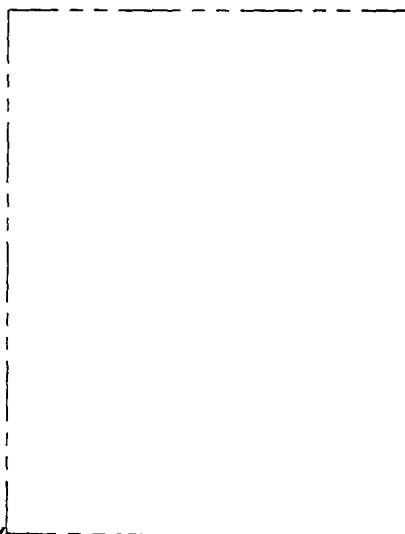
Prepared For:

MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | | |
|---------------------|-------------------|---------------------|
| Compiled by: A.R.S. | Date: 10/94 | Figure
31 |
| Prepared by: M.J.V. | Scale: SHOWN | |
| Project Mgr: P.J.P. | Revision: FINAL | |
| Proj No: 06634J | File No: 06634001 | |

N



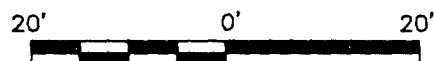
APPROXIMATE VOLUME CALCULATIONS
FOR SURFACE/SUBSURFACE
SOIL REMOVAL

AREA = 2,268 S.F.

VOLUME = 2,268 S.F. X 9.6 FT. DEEP

= 21,773 C.F.

= 806 C.Y.



LEGEND

----- ACTUAL BOUNDARY OF TARGET AREA

NOTES:

1. ALL DATA USED IN ABOVE CALCULATIONS WAS DERIVED FROM AS-BUILT DRAWINGS.
2. ACTUAL TONNAGE OF APSS SOIL REMOVED EQUALED 1,116.51 TONS.

Title:

AS-BUILT VOLUME CALCULATIONS FOR SOIL REMOVED IN THE APSS

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX

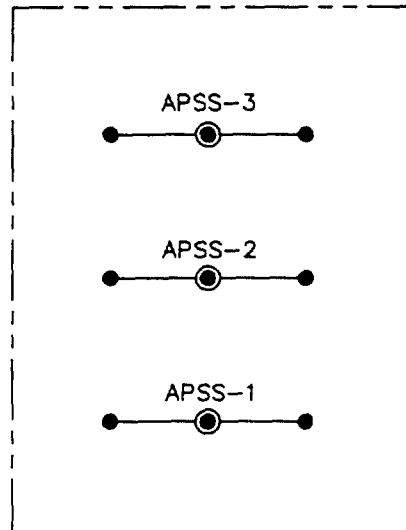
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: A.R.S. | Date: 10/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634043 |

Figure

32

N

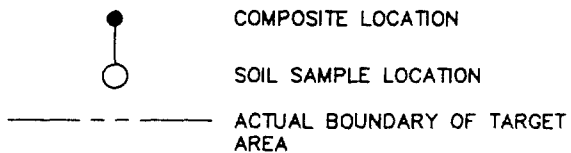


AREA = 2,268 S.F.

TOTAL NO. OF SOIL SAMPLES= 3

TOTAL NO. OF COMPOSITES= 9

20' 0' 20'

LEGEND**NOTE:**

1. POST-EXCAVATION SOIL SAMPLES APSS-1, APSS-2 AND APSS-3 WERE COLLECTED AT 9' BGS ON JUNE 9, 1994.
2. EACH POST-EXCAVATION SOIL SAMPLE WAS OBTAINED FROM A COMPOSITE TAKEN FROM THREE INDIVIDUAL SAMPLING LOCATIONS.

Title:

APPROXIMATE LOCATIONS OF APSS POST-EXCAVATION SOIL SAMPLES

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUXROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: A.R.S.

Prepared by: M.J.V.

Project Mgr: P.J.P.

Proj No: 06634J

Date: 10/94

Scale: SHOWN

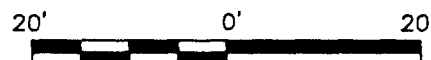
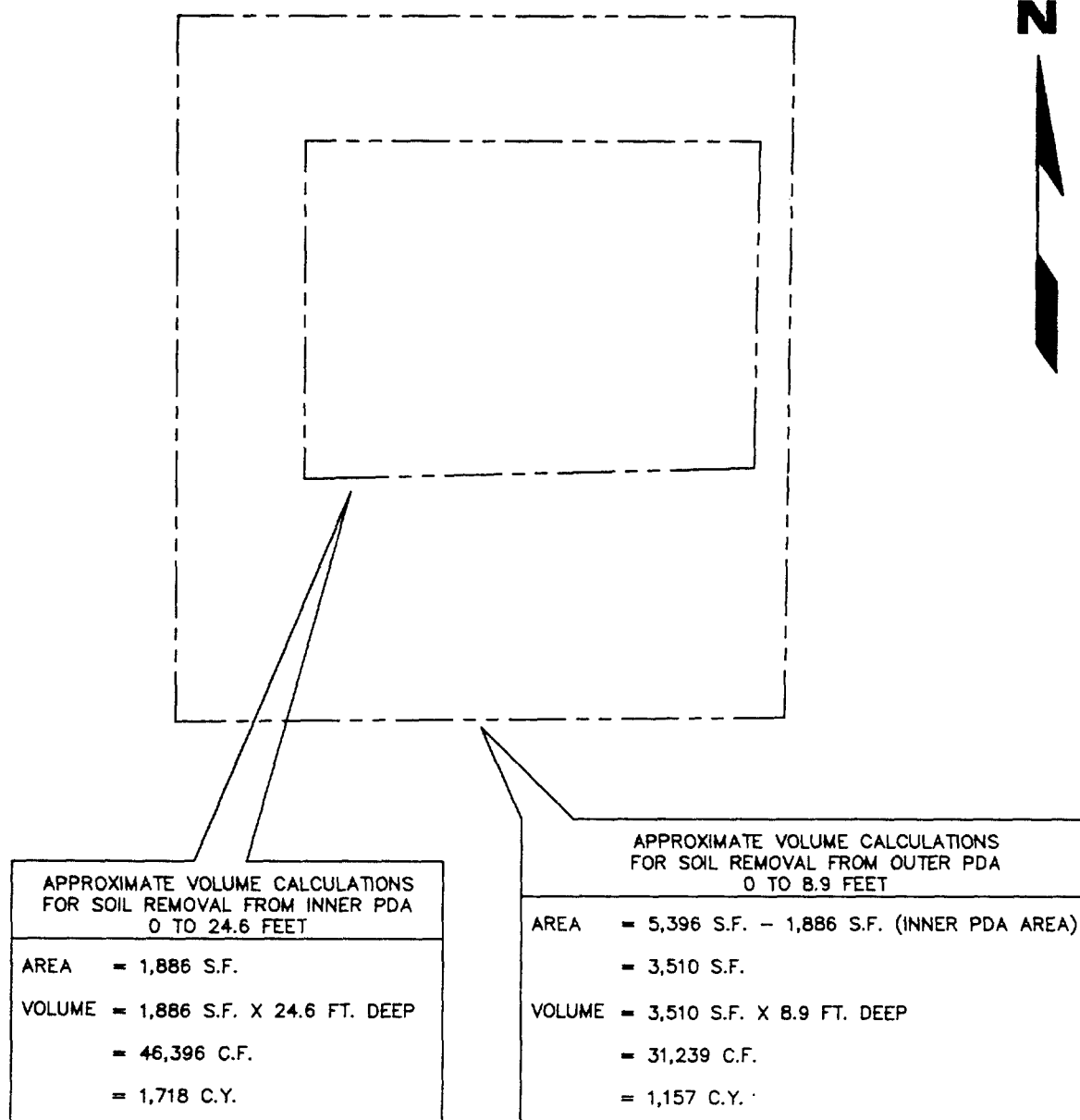
Revision: FINAL

File No: 06634002

Figure

33

N

**LEGEND**

----- ACTUAL BOUNDARY OF TARGET AREA

NOTES:

1. ALL DATA USED IN ABOVE CALCULATIONS WAS DERIVED FROM AS-BUILT DRAWINGS.
2. ACTUAL TONNAGE OF INNER PDA SOIL REMOVED EQUALED 2,379.87 TONS.
3. ACTUAL TONNAGE OF OUTER PDA SOIL REMOVED EQUALED 1,602.77 TONS.

Title:

AS-BUILT VOLUME CALCULATIONS FOR SOIL REMOVED IN THE PCB DISPOSAL AREA (PDA)

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

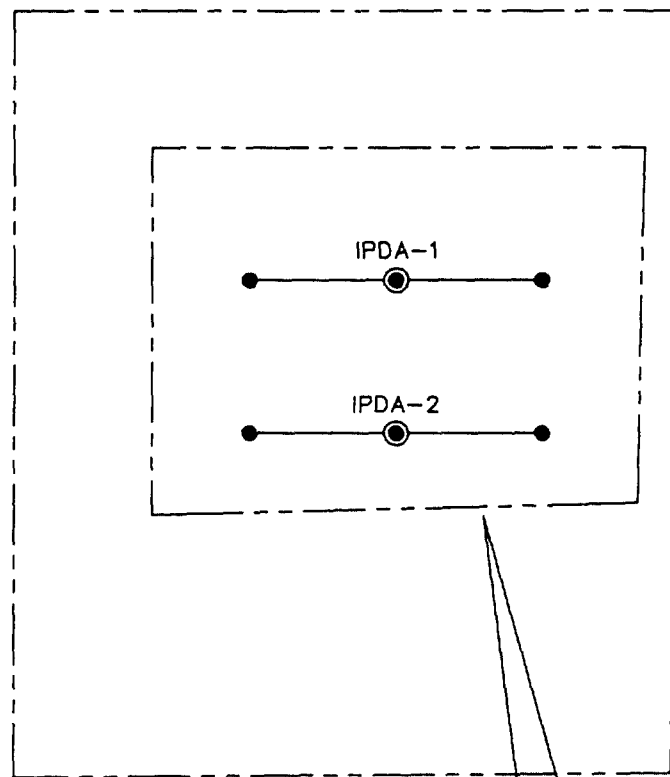
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: A.R.S. | Date: 10/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634042 |

Figure

34

N



AREA = 1,886 S.F.

TOTAL NO. OF SOIL SAMPLES= 2

TOTAL NO. OF COMPOSITES= 6

20' 0' 20'

LEGEND

COMPOSITE LOCATION

SOIL SAMPLE LOCATION

ACTUAL BOUNDARY OF TARGET AREA

NOTES:

1. POST-EXCAVATION SOIL SAMPLES IPDA-1 AND IPDA-2 WERE COLLECTED AT 24' BGS ON JUNE 28, 1994.
2. EACH POST-EXCAVATION SOIL SAMPLE WAS OBTAINED FROM A COMPOSITE TAKEN FROM THREE INDIVIDUAL SAMPLING LOCATIONS.

Title:

APPROXIMATE LOCATIONS OF INNER PDA POST-EXCAVATION SOIL SAMPLES

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX

ROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: J.V.V. Date: 10/94

Prepared by: M.J.V. Scale: SHOWN

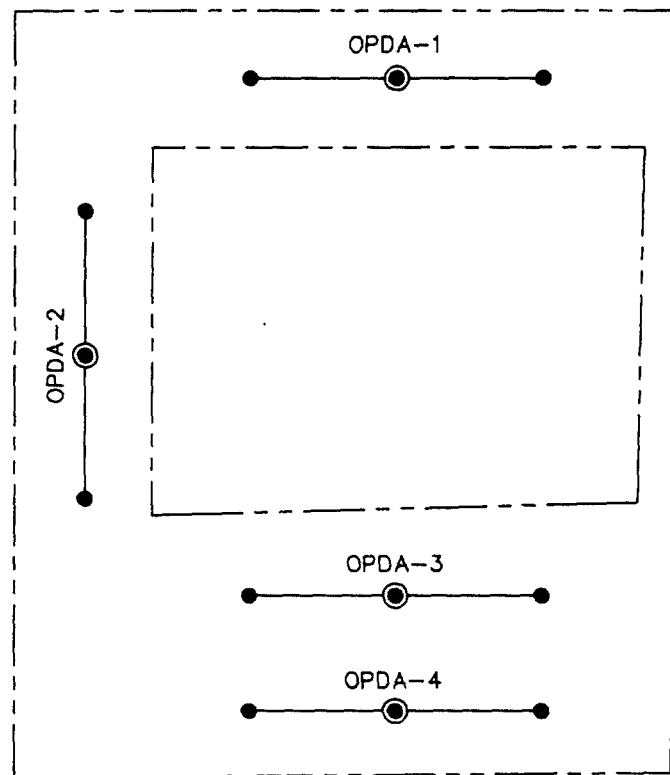
Project Mgr: P.J.P. Revision: FINAL

Proj No: 06634J File No: 06634003

Figure

35

N






AREA = 3,510 S.F.

TOTAL NO. OF SOIL SAMPLES= 4

TOTAL NO. OF COMPOSITES= 12

20' 0' 20'

LEGEND

-  COMPOSITE LOCATION
 SOIL SAMPLE LOCATION
 ACTUAL BOUNDARY OF TARGET AREA

NOTES:

1. POST-EXCAVATION SOIL SAMPLES OPDA-1, OPDA-2, OPDA-3 AND OPDA-4 WERE COLLECTED AT 9' BGS ON JULY 7, 1994.
2. EACH POST-EXCAVATION SOIL SAMPLE WAS OBTAINED FROM A COMPOSITE TAKEN FROM THREE INDIVIDUAL SAMPLING LOCATIONS.

Title:

APPROXIMATE LOCATIONS OF OUTER PDA POST-EXCAVATION SOIL SAMPLES

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

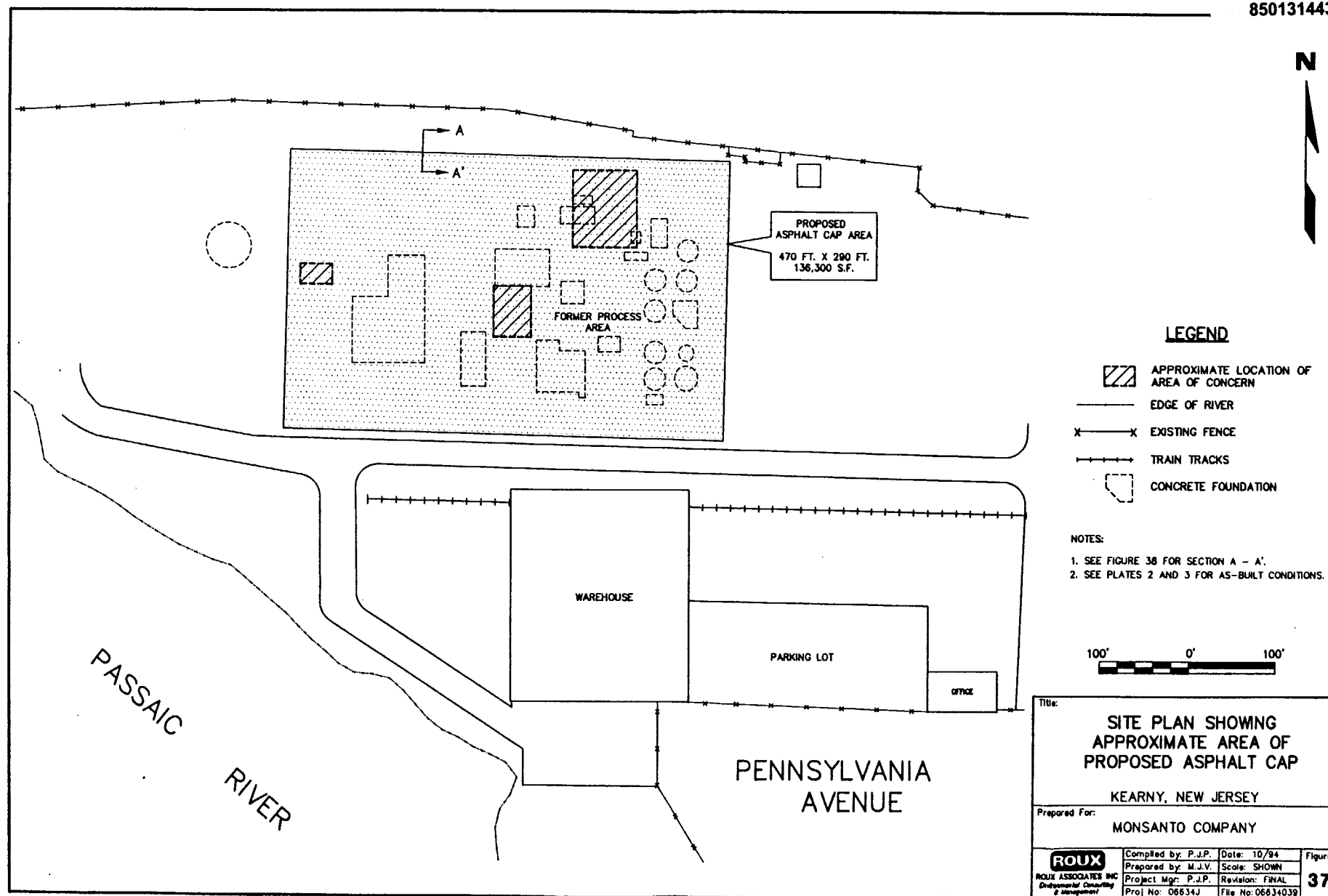
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

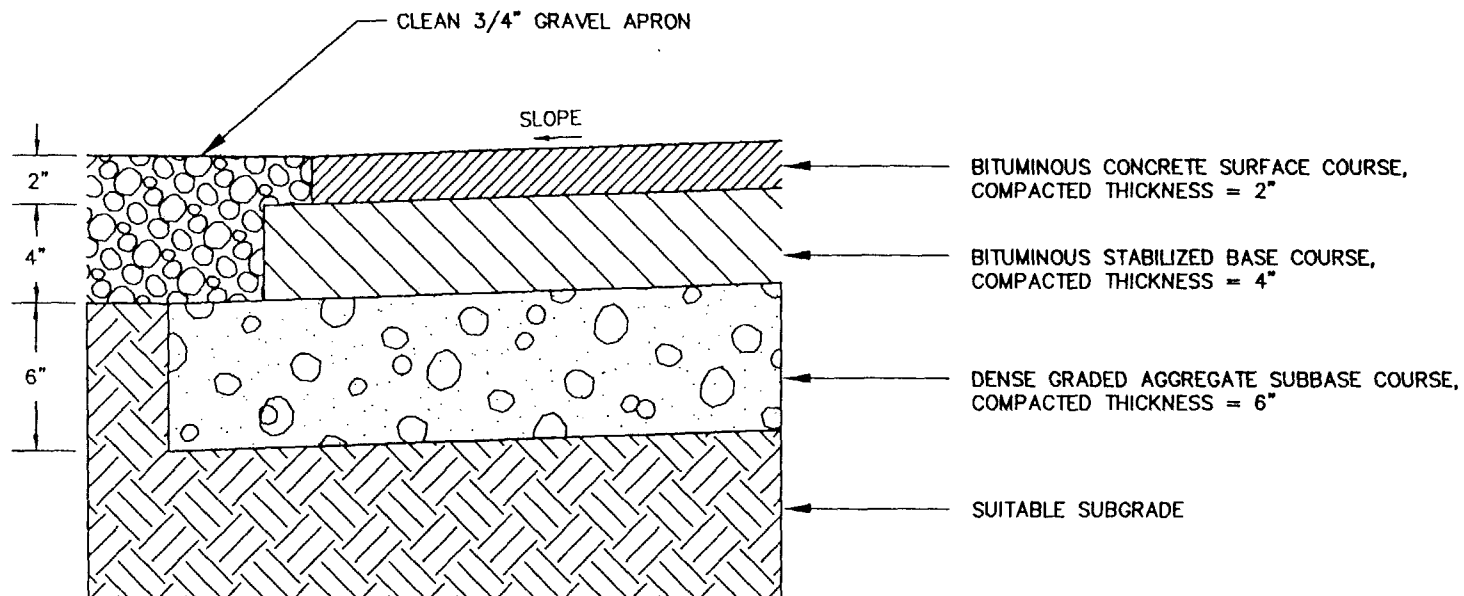
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|---------------------|-------------------|
| Compiled by: J.V.V. | Date: 10/94 |
| Prepared by: M.J.V. | Scale: SHOWN |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634004 |

Figure

36

N





NOTES:

1. GENERAL: MATERIALS AND MIXTURES COMPLIED WITH SECTION 304 AND SECTION 404 OF THE NEW JERSEY STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS.

BITUMINOUS CONCRETE SURFACE COURSE
MIXTURE: MIX NO. 1-5, TABLE 903-1

BITUMINOUS STABILIZED BASE COURSE
MIXTURE: MIX NO. 1-2, STONE MIX, TABLE 903-1

Title:

**ASPHALT CAP SECTION
A - A'**

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

Compiled by: P.J.P.
Prepared by: M.J.V.
Project Mgr: P.J.P.
Proj No: 06634J

Date: 11/94
Scale: N.T.S.
Revision: FINAL
File No: 06634040

Figure

38

850131444

Exhibit F

3

REMEDIAL ACTION REPORT
Volume II of XIII

MONSANTO KEARNY PLANT
Kearny, New Jersey



Associates, Inc.

ENVIRONMENTAL CONSULTING & MANAGEMENT

850131446

**REMEDIAL ACTION REPORT
Volume II of XIII**

**MONSANTO KEARNY PLANT
Kearny, New Jersey**

November 11, 1994

Prepared for:

**MONSANTO COMPANY
Kearny, New Jersey**

Prepared by:

**ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066**

VOLUME II OF XIII
APPENDICES A THROUGH T



State of New Jersey

DEPARTMENT OF LAW AND PUBLIC SAFETY
DIVISION OF LAW
ENVIRONMENTAL PROTECTION SECTION
RICHARD J. HUGHES JUSTICE COMPLEX
CN 112
TRENTON 08625

LAWRENCE E. STANLEY
DEPUTY ATTORNEY GENERAL
SECTION CHIEF

JOHN M. VAN DALEN
DEPUTY ATTORNEY GENERAL
ASSISTANT SECTION CHIEF

Richard F. Encei
DEPUTY ATTORNEY GENERAL
ASSISTANT SECTION CHIEF

Peter N. Perretti, Jr.
ATTORNEY GENERAL

Kenneth S. Levy
STANT ATTORNEY GENERAL
DIRECTOR

(609) 292-1557

June 21, 1989

Gail Allyn, Esq.
Pitney, Hardin, Kipp & Szuch
163 Madison Avenue
CN 1945
Morristown, NJ 07960

EXPRESS MAIL

Re: NJDEP v. Monsanto Chemical Company
Docket No. W62710-88

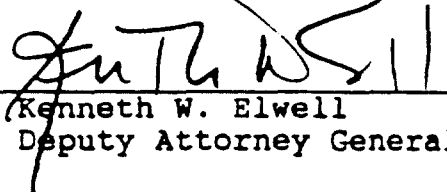
Dear Ms. Allyn:

Enclosed herewith are duplicate original Administrative Consent Orders for signature by Monsanto Chemical Company. These documents have been redrafted to conform to the details of our agreement as set forth in my letter to you dated June 9, 1989. Kindly have the appropriate Monsanto representative sign both documents and return them to me for signature by Ronald T. Corcoran of the Department of Environmental Protection. You will then be provided with a fully executed document. I understand it will take some time before Monsanto's signature is obtained. Monsanto is thus to return the originals within 21 days of receipt of this letter.

Very truly yours,

PETER N. PERRETTI, JR.
Attorney General of New Jersey

By:


Kenneth W. Elwell
Deputy Attorney General

KWE:fas

Enclosures

c: Dennis Hart, Chief, BSCM, DEP
John Renella, Assistant Director,
Hazardous Waste Enforcement Element, DEP

850131450

ST OFFICE TO ADDRESSEE EXPRESS MAIL

EXT DAY SERVICE



B 032 273 33

| | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| ORIGIN | | Date of: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. |
| Post Office ZIP Code: | Time of: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. | Before Receipt: \$ |
| Address of Receiving Office: | Weight: <input type="checkbox"/> lb. <input type="checkbox"/> oz. | C.O.D. \$ |
| ACCEPTANCE
<input type="checkbox"/> Next Day Delivery or <input type="checkbox"/> Second Day Delivery
<input type="checkbox"/> By 12 Noon or <input type="checkbox"/> By 3:00 PM
<input type="checkbox"/> Express Mail Military Service <input type="checkbox"/> International Express Mail
Country Code: | | |
| Express Mail Corporate Account No. | Federal Agency Account No. | |

FROM:

Kenneth E. Elwell, SAC
 Division of Law
 R.J. Hughes Justice Complex
 CR 112
 Trenton, NJ 08645

| | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------|
| DESTINATION | Date of Delivery: | Time of Delivery: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. |
| X Signature of Addressee or Agent | | |
| DELIVERY WAS ATTEMPTED | Date: | Time: <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. |
| Signature of Delivery Employee: 2. | | |
| Waiver of Signature and Indemnity (Domestic Only)
I hereby agree to hold the United States Postal Service harmless from all claims for loss or damage to the contents of this mail, and I authorize the delivery employee to sign this waiver on my behalf. | SIGNED: _____ | |

ADDRESSEE'S COPY

TO: Telephone Number: _____

Gail Allyn, Esq.
 Pitney, Hardin, Ripp & Saxon
 163 Madison Avenue
 CR 145
 Morristown, NJ 07960

850131451



DN 023
 Version N.J. 08625-0023

809.633-1452

State of New Jersey
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF HAZARDOUS WASTE MANAGEMENT

Monroe M. Putnam
 Deputy Director
 Hazardous Waste Operations

John J. Trella, Ph.D., Director

Lance R. Miller
 Deputy Director
 Responsible Party Remedial Action

IN THE MATTER OF THE : ADMINISTRATIVE
 MONSANTO CHEMICAL COMPANY SITE : CONSENT
 ORDER

This Administrative Consent Order is entered into pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection (hereinafter "NJDEP" or the "Department") by N.J.S.A. 13:1D-1 et seq., the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., and the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and duly delegated to the Assistant Director for the Responsible Party Cleanup Element of the Division of Hazardous Waste Management pursuant to N.J.S.A. 13:1B-4.

FINDINGS

1. Monsanto Chemical Company (hereinafter "Monsanto"), a Delaware corporation, owns the property located on Pennsylvania Avenue in the Town of Kearny, County of Hudson, State of New Jersey, bordered by the Passaic River on the West and by the Conrail Railroad yard on the North (hereinafter "the Site"). The Site is designated Lot 49, Block 284 and Lot 19, Block 289 on the municipal tax maps. Monsanto produces surfactants and alkylphenols at the Site which also serves as a terminal for other Monsanto products.

2. The Site (see Attachment A, which is incorporated herein) was used as a rail yard until Monsanto purchased the property in the early 1950's. Monsanto has used the Site since that time to produce surfactants, alkylphenols and phosphates. Monsanto continues to produce surfactants and alkylphenols at the Site; however the phosphate operation has been discontinued.

3. Production of the surfactants (registered under the Monsanto trade name "Sterox") and the alkylphenols occurs in production units located in the central region of the Site (hereinafter the "AP/Sterox units"). Polychlorinated biphenyls (hereinafter "PCBs"), a hazardous substance as defined in the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and a pollutant as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., were used by Monsanto until in the mid-1960's in the heat transfer liquid within the heat transfer system of the AP/Sterox units.

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4. On November 14, 1986, Monsanto submitted to the Department a report entitled, "Final Report of Investigation and Remedial Action Plan for the Monsanto Kearny, New Jersey, Plant" (hereinafter "Investigation Report"). The Investigation Report, which was prepared by Monsanto, dated November 10, 1986, states that in the mid-1960's approximately 2,000 gallons of the heat transfer liquid containing PCBs were landfilled on a one time basis. Monsanto landfilled the heat transfer liquid into an unlined pit near the control building in the northern region of the Site, which is referenced on Attachment A and is incorporated herein. DEP has determined that this landfilling constitutes a prohibited discharge in violation of N.J.S.A. 58:10-23.11(c).

5. In 1979, Monsanto initiated a cleanup of the PCBs referenced in Paragraph 4, above. Monsanto states that approximately 85 cubic yards of PCB contaminated soil was disposed off-site at the Chemical Waste Disposal Facility located in Model City, New York. The wastes were manifested and copies of all manifests were supplied to the DEP.

6. In the early 1980's Monsanto instituted a company-wide ground water assessment of many of its plants. The active portions of the Kearny plant site were reviewed, and subsequently the AP/Sterox unit was identified as an area of potential concern.

7. In 1984, Monsanto initiated a hydrogeologic investigation to assess the presence of PCBs remaining in the soil at the Site. This hydrogeologic investigation focused on the AP/Sterox Unit area of the Site.

8. Analyses of soil borings taken in October of 1984 by Monsanto revealed the presence of PCBs in the soil. The analyses revealed quantities of Aroclor 1248, a type of PCBs, ranging up to 123,000 ppm in the soil. Although the soil borings were analyzed for PCBs Monsanto observed the presence of petroleum hydrocarbons. Monsanto noted the presence of petroleum hydrocarbons in the boring logs and further investigated.

9. To assess the presence of petroleum hydrocarbons, four test pits were dug by Monsanto in October of 1984 in the area of the AP/Sterox units at the site. Monsanto's Investigation Report indicated that the excavation revealed the presence of an oily residue in the saturated soil matrix in three of the four test pits. Sampling by Monsanto of the oily residue from one test pit was reported in Monsanto's Investigation Report as containing toluene, 3-ethyl-3-methyl hexane, 1,2-dimethylbenzene, 3,3 dimethyl hexynol, 2,2,4-trimethylhexane, 2,3-dimethylhexane and 2, 3-dimethylheptane. Monsanto states in its Investigation Report that these compounds were related to raw materials used by Monsanto in the AP/Sterox Unit operation. These compounds are hazardous substances as defined in the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and are pollutants as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

10. In 1984, Monsanto installed a series of shallow and deep monitoring wells at the Site. These wells were sampled in October of 1984 and August of 1986. Analyses from both of these sampling events revealed the presence of toluene. Additional compounds detected in the ground water wells, including analyses of samples from an upgradient boundary well were: benzene, ethylbenzene, methylene chloride, naphthalene, and chlorobenzene.

These compounds are hazardous substances as defined in the Spill Compensation and Control Act, N.J.S.A. 58:23-11 et seq. and are pollutants as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

11. In September of 1986, during the installation of a dike around an aboveground fuel oil tank in the north east region of the Site referenced on Attachment A, which is incorporated herein, a viscous floating substance was discovered by Monsanto on top of the groundwater. Analysis has indicated this substance to be a mixture of fuel oil #4 and fuel oil #6. These petroleum hydrocarbons are hazardous substances as defined in the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11 et seq. and are pollutants as defined in the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

12. On November 14, 1986, the results of Monsanto's two-year hydrogeologic investigation were submitted in the Investigation Report for comment and review. A supplement to the Investigation report entitled, "Site Study and Remediation Plan" was also submitted on that date which described the remedial measures already undertaken at the Site by Monsanto.

13. Up until the time the reports referenced in paragraph 12 above were submitted to the Department, the Department had no knowledge of, nor involvement in the investigation of the discharge of hazardous substances of pollutants at the Site. Failure to immediately notify the Department concerning the discharge of hazardous substances is a violation of the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11(e).

14. On April 21, 1988, Monsanto submitted to the Department a report entitled "Draft Remedial Investigation Report for Monsanto's Kearny, New Jersey Plant" (hereinafter, "Draft RI Report") to address all of the additional information requested by the Department. On the same day Monsanto submitted two additional reports: "Draft Report for Interim Remedial Measures" (hereinafter "Draft IRM Report"), and a "Draft Feasibility Study" (hereinafter "Draft FS"). The Draft RI and the Draft IRM Reports are currently under review by the Department. Monsanto submitted the Draft FS Report prematurely since the extent of the contamination has not been fully delineated.

15. Based on these FINDINGS, the Department alleges that Monsanto has violated the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., specifically N.J.S.A. 58:10A-6, and the regulations promulgated pursuant thereto, N.J.A.C. 7:14A-1 et seq., specifically N.J.A.C. 7:14A-1.2(c), the Spill Compensation and Control Act, N.J.S.A. 58:10-23.11c. and the regulations promulgated pursuant thereto, N.J.A.C. 7:1E-1 et seq.

16. To determine the nature and extent of the problems presented by the discharge of pollutants and hazardous substances at the Site and to develop environmentally sound remedial actions, it is necessary to complete the remedial investigation and feasibility study of remedial action alternatives (hereinafter "RI/FS") already begun by Monsanto for the Site. To correct the problem presented by the discharge, it is necessary to implement a remedial action plan.

17. Monsanto neither admits nor denies the accuracy of the FINDINGS and does not concede that it violated any statutes or regulations herein, however, in order to resolve this matter without the necessity for litigation, Monsanto has agreed at its own cost to complete a RI/FS and to design and implement the remedial action alternative selected by the Department to remedy all contamination at the Site, emanating from the Site, or which has emanated from the Site.

18. This Administrative Consent Order incorporates and supersedes all prior alleged violations set forth in these FINDINGS. Additionally, this Administrative Consent Order will settle and release all claims asserted by the Department in its civil action pending in the Superior Court of New Jersey, Docket No. W-62710-88E provided that the Administrative Consent Order is executed and the penalty referenced in Paragraph 19 below is paid by Monsanto.

ORDER

NOW THEREFORE IT IS HEREBY ORDERED AND AGREED THAT:

I. Penalty and Reimbursement of Damages

A. Reimbursement of Prior Administrative Costs and Damages

19. Within thirty (30) calendar days after the effective date of this Administrative Consent Order, Monsanto shall pay a \$250,000.00 penalty to the Department, by certified check payable to the "Treasurer, State of New Jersey", for the violations referenced in the FINDINGS section hereinabove. Payment shall be submitted to the contact listed in paragraph 44.

20. Within thirty (30) calendar days after the effective date of this Administrative Consent Order, Monsanto shall submit the amount of \$10,289.29 to the Department as payment for all costs incurred by the Department up until September 9, 1988 in connection with the investigation of, and response to, the matters described in the FINDINGS hereinabove, including the costs associated with the preparation of this Administrative Consent Order. Payment of the above amount shall be made by a cashier's or certified check payable to the "Treasurer, State of New Jersey". Payment shall be submitted to the contact listed in paragraph 44.

II. Remedial Investigation and Cleanup

A. Interim Remedial Measures

21. Monsanto shall continue implementation of all Interim Remedial Measures (hereinafter "IRM") referenced in paragraph 12 above, undertaken at the Site.

22. If upon review of the Draft IRM Report referenced in Paragraph 14 the Department determines that additional IRM work is required, Monsanto shall conduct the additional IRM work as directed by the Department in accordance with Appendix A which is attached hereto and made a part hereof, and submit a second draft IRM Report.

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23. Within sixty (60) calendar days after receipt of the Department's written comments on the Draft IRM Report or the second draft IRM Report (if applicable pursuant to the preceding paragraph) Monsanto shall modify the Draft IRM Report to conform to the Department's comments and shall submit the modified IRM Report to the Department. The determination as to whether or not the modified IRM Report, as resubmitted, conforms to the Department's comments and is otherwise acceptable to the Department shall be made solely by the Department in writing.

B. Remedial Investigation

24. If upon review of the report "Draft Remedial Investigation Report for Monsanto's Kearny, New Jersey, Plant" (hereinafter "draft RI Report") the Department determines that additional remedial investigation is required, Monsanto shall conduct the additional remedial investigation work as directed by the Department in accordance with Appendix B, which is attached hereto and made a part hereof, and submit a second draft RI Report.

25. Within sixty (60) calendar days after receipt of the Department's written comments on the draft or second draft (if applicable pursuant to the preceding paragraph) RI Report, Monsanto shall modify the draft or second draft RI Report to conform to the Department's comments and shall submit the modified RI Report to the Department. The determination as to whether or not the modified RI Report, as resubmitted, conforms with the Department's comments and is otherwise acceptable shall be made solely by the Department in writing.

C. Feasibility Study

26. Within seventy-five (75) calendar days after receipt of the Department's written final approval of the RI Report, or as otherwise directed by the Department, Monsanto shall submit to the Department a draft Feasibility Study Work Plan (hereinafter, "FS Work Plan") in accordance with the Scope of Work set forth in Appendix E, which is attached hereto and made a part hereof.

27. Within sixty (60) calendar days after receipt of the Department's written comments on the draft FS Work Plan, Monsanto shall modify the draft FS Work Plan to conform to the Department's comments and shall submit the modified FS Work Plan to the Department. The determination as to whether or not the modified FS Work Plan, as resubmitted, conforms to the Department's comments and is otherwise acceptable shall be made solely by the Department in writing.

28. Upon receipt of the Department's written final approval of the FS Work Plan, Monsanto shall conduct the feasibility study in accordance with the approved FS Work Plan and the schedule therein.

29. Monsanto shall submit to the Department a draft Feasibility Study Report (hereinafter "FS Report") in accordance with Appendix E and the approved FS Work Plan and the schedule therein.

30. Within sixty (60) calendar days after receipt of the Department's written comments on the draft FS Report, Monsanto shall modify the draft FS Report to conform to the Department's comments and shall submit the modified

FS Report to the Department. The determination as to whether or not the modified FS Report, as resubmitted, conforms to the Department's comments and is otherwise acceptable shall be made solely by the Department in writing.

D. Remedial Action

31. The Department will determine the remedial action alternative or alternatives which meet the cleanup factors listed in Appendix E, ID, 1 through 3.

32. Within thirty (30) calendar days after receipt from NJDEP of NJDEP's determination of which remedial action alternatives meet the cleanup factors listed in Appendix E, ID, 1 through 3, Monsanto shall select one of the alternatives and shall inform NJDEP which of the remedial action alternative Monsanto shall implement. Within ninety (90) calendar days (of NJDEP's determination referenced above), Monsanto shall submit to NJDEP a detailed draft Remedial Action Plan pursuant to the requirements in Appendix F, which is attached hereto and made a part hereof. Of the alternatives which NJDEP has determined meet the cleanup factors, Monsanto may implement the remedial action alternative which it considers cost effective and technically practicable.

33. Within sixty (60) calendar days after receipt of the Department's written comments on the draft Remedial Action Plan, Monsanto shall modify the draft Remedial Action Plan to conform to the Department's comments and shall submit the modified Remedial Action Plan to the Department. The determination as to whether or not the modified Remedial Action Plan, as resubmitted, conforms to the Department's comments and is otherwise acceptable shall be made solely by the Department in writing.

34. Upon receipt of the Department's written final approval of the Remedial Action Plan, Monsanto shall implement the approved Remedial Action Plan in accordance with the schedule therein.

E. Additional Remedial Investigation and Remedial Action

35. If at any time prior to Monsanto's receipt of written notice from the Department pursuant to paragraph 83 the Department determines that the criteria set forth in Appendix E (Section I.D.) are not being achieved or that additional remedial investigation and/or remedial action is required to protect human health or the environment, Monsanto shall conduct such additional activities in accordance with Appendices A, B, E or F which are attached hereto and made a part hereof, and as directed by the Department.

F. Progress Reports

36. Monsanto shall submit to the Department quarterly progress reports; the quarters being January through March, April through June, July through September, and October through December of each calendar year. Each progress report shall be submitted within 30 days following the quarter being reported. Monsanto shall submit the first progress report as directed by the Department. Each progress report shall detail the status of Monsanto's compliance with this Administrative Consent Order and shall include the following:

- a. Identification of Site and reference to this Administrative Consent Order;
- b. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were initiated during the reporting period;
- c. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were initiated in a previous reporting period, which are still in progress and which will continue to be carried out during the next reporting period;
- d. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) which were completed during this reporting period;
- e. Identify specific requirements of this Administrative Consent Order (including the corresponding paragraph numbers or schedule) which should have been completed during the reporting period and were not;
- f. An explanation of any non-compliance with any approved work plan(s), schedule(s) or Remedial Action Plan, and actions taken or to be taken to rectify non-compliance;
- g. Identify the specific requirements of this Administrative Consent Order (including the corresponding paragraph number or schedule) that will be initiated during the upcoming reporting period.

III. Permits

37. Monsanto shall obtain all necessary Federal, State and local environmental permits for existing activities and, where applicable, former activities, in accordance with the requirements of N.J.A.C. 7:14A-1 et seq., N.J.A.C. 7:26-1 et seq., and N.J.A.C. 7:27-8, and other applicable statutes and regulations. This Administrative Consent Order shall not be construed to be a permit or in lieu of a permit for existing or former activities which require permits.

38. Monsanto shall submit complete applications for all Federal, State and local permits required to carry out the obligations of this Administrative Consent Order in accordance with the approved time schedules.

39. Within thirty (30) calendar days of receipt of written comments concerning any permit application to a Federal, State or local agency, or sooner if required by the permitting agency, Monsanto shall modify the permit application to conform to the agency's comments and resubmit the permit application to the agency. The determination as to whether or not the permit application, as resubmitted, conforms with the agency's comments or is otherwise acceptable to the agency shall be made solely by the agency in writing.

40. This Administrative Consent Order shall not relieve Monsanto from obtaining and complying with all applicable Federal, State and local

permits, as well as all applicable statutes and regulations while carrying out the obligations imposed by this Administrative Consent Order.

41. This Administrative Consent Order shall not preclude the Department from requiring that Monsanto apply for any permit or permit modification issued by the Department under the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and/or any other statutory authority for the matters covered herein. The terms and conditions of any such permit shall not be preempted by the terms and conditions of this Administrative Consent Order even if the terms and conditions of any such permit are more stringent than the terms and conditions of this Administrative Consent Order.

IV. Project Coordination

42. Monsanto shall submit to the Department all documents required by this Administrative Consent Order, including correspondence relating to force majeure issues, by certified mail, return receipt requested by overnight mail service with acknowledgement of receipt form for the Department's signature or by hand delivery with an acknowledgement of receipt form for the Department's signature. The date that the Department executes the receipt or acknowledgement will be the date the Department uses to determine Monsanto's compliance with the requirements of this Administrative Consent Order and the applicability of stipulated penalties.

43. Within seven (7) calendar days after the effective date of this Administrative Consent Order, Monsanto shall submit to the Department the name, title, address and telephone number of the individual who shall be the Monsanto's contact for the Department for all matters concerning this Administrative Consent Order. The individual identified in the following paragraph shall be the Department's contact for Monsanto for all matters concerning this Administrative Consent Order.

44. Monsanto shall submit three (3) copies of all documents required by this Administrative Order, unless otherwise directed by the Department, to:

Dennis Kart, Bureau Chief
New Jersey Department of Environmental Protection
Division of Hazardous Waste Management
Bureau of State Case Management - 5th Floor
401 East State Street
Trenton, N.J. 08625

45. Monsanto shall notify, both verbally and in writing, the contact person listed above, or the assigned case manager two weeks prior to the initiation of any field activities or as soon as possible following any necessary schedule change.

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V. Financial Requirements

A. Financial Assurance

46. Within thirty (30) calendar days after the effective date of this Administrative Consent Order, Monsanto shall submit to the Department a proposed irrevocable letter of credit which meets the following requirements:

- a. Is identical to the wording specified in Appendix G which is attached hereto and made a part hereof;
- b. Is issued by a New Jersey State or Federally chartered bank, savings bank, or savings and loan association, which has its principal office in New Jersey, unless otherwise approved by the Department.
- c. Is accompanied by a letter from Monsanto referring to the Letter of Credit by number, issuing institution and date and providing the following information: the name and address of the facility and/or Site which is the subject of the Administrative Consent Order and the amount of funds securing the Monsanto's performance of all its obligations under the Administrative Consent Order.

47. Within thirty (30) calendar days after the effective date of this Administrative Consent Order, Monsanto shall submit to the Department a proposed irrevocable standby trust fund agreement which meets the following requirements:

- a. Is identical to the wording specified in Appendix H which is attached hereto and made a part hereof;
- b. The irrevocable standby trust fund shall be the depository for all funds paid pursuant to a draft by the Department against the letter of credit;
- c. The trustee shall be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or New Jersey agency;
- d. Is accompanied by a certification of acknowledgement that is identical to the wording specified in Appendix H.

48. Within thirty (30) calendar days after receipt of the Department's written comments on the proposed letter of credit, the proposed trust agreement, and the proposed certification of acknowledgement, Monsanto shall modify the documents to conform to the Department's comments and resubmit them to the Department. The determination as to whether or not the modified documents, as resubmitted, conform to the Department's comments and are otherwise acceptable to the Department shall be made solely by the Department in writing.

49. Within fourteen (14) calendar days after receipt of the Department's written approval of the letter of credit, the trust agreement, and the certification of acknowledgement, Monsanto shall:

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- a. Obtain and provide to the Department the irrevocable letter of credit in the amount of \$3,250,000;
- b. Establish the irrevocable standby trust fund and deposit an initial amount of One Thousand Dollars (\$ 1,000.00) into the irrevocable standby trust fund; and
- c. Submit an originally signed duplicate of the trust agreement to the Department accompanied by the certification of acknowledgement.

50. Monsanto shall maintain the standby trust fund until terminated by the written agreement of the Department, the trustee and Monsanto, or of the trustee and the Department if Monsanto ceases to exist. Monsanto shall maintain the letter of credit until the Department returns the letter of credit to the issuing institution for termination with notice to Monsanto. In the event that the Department determines that Monsanto has failed to perform any of its obligations under this Administrative Consent Order, including the obligation to provide the Department access pursuant to paragraph 76 below, the Department may draw on the letter of credit to the extent of the unsatisfied obligations, as determined by the Department in its sole discretion; provided, however, that before any draw can be made, the Department shall notify Monsanto in writing of the obligation(s) which it has not performed, and Monsanto shall have a reasonable time, not to exceed thirty (30) calendar days, to perform such obligation(s).

51. At any time, Monsanto may apply to the Department to substitute other financial assurances in a form, manner and amount acceptable to the Department.

B. Project Cost Review

52. Beginning three hundred sixty-five (365) calendar days after the effective date of this Administrative Consent Order and annually thereafter on that same calendar day, Monsanto shall submit to the Department a detailed review of all costs required for Monsanto's compliance with this Administrative Consent Order. This cost review shall include a summary of task oriented or response action monies spent to date pursuant to this Administrative Consent Order, the estimated cost of all future expenditures required to comply with this Administrative Consent Order (including any operation and maintenance costs), and the reason for any changes from the previous cost review submitted by Monsanto. For the purposes of this paragraph only, "task oriented or response action" shall mean the total expenses incurred in the Interim Remedial Measures, the Remedial Investigation, the Feasibility Study and the design and implementation of the remedial action.

53. At any time after Monsanto submits the first cost review pursuant to the preceding paragraph, Monsanto may request the Department's approval to reduce the amount of the letter of credit to reflect the remaining costs of performing its obligations under this Administrative Consent Order. If the Department grants written approval of the request, Monsanto may amend the amount of the then existing letter of credit.

54. If the estimated cost of meeting Monsanto's obligations in this Administrative Consent Order at any time exceeds the amount of the letter of

credit, Monsanto shall, within thirty (30) calendar days after receipt of written notice of the Department's determination, increase the amount of the then existing letter of credit so that it is equal to the estimated cost as determined by the Department.

C. Administrative Oversight Cost Reimbursement

55. Within thirty (30) calendar days after receipt from the Department of an itemized accounting (which shall include but not be limited to personnel performing services, the hours worked, the rates charged, receipts or other documentation of expenses and laboratory invoices) of all costs incurred in connection with its administrative oversight functions of this Administrative Consent Order for a fiscal year, or any part thereof, Monsanto shall submit to the Department a cashier's or certified check payable to the "Treasurer, State of New Jersey" for the full amount of the Department's administrative oversight costs.

D. Stipulated Penalties

56. Monsanto shall pay stipulated penalties to the Department for its failure to comply with any of the deadlines and schedules required by this Administrative Consent Order including those established and approved by the Department in writing pursuant to this Administrative Consent Order. Each deadline or schedule not complied with shall be considered a separate violation. Payment of stipulated penalties shall be made according to the following schedule, unless the Department has modified the compliance date pursuant to the force majeure provisions hereinbelow:

| <u>Calendar Days After Due Date</u> | <u>Stipulated Penalties</u> |
|-------------------------------------|-----------------------------|
| 1 - 7 | \$ 1,000 per calendar day |
| 8 - 14 | \$ 2,000 per calendar day |
| 15 - 21 | \$ 3,000 per calendar day |
| 22 - 28 | \$ 5,000 per calendar day |
| 29 - over | \$10,000 per calendar day |

57. Any such penalty shall be due and payable thirty (30) calendar days following receipt of a written demand by the Department. Payment of stipulated penalties shall be made by cashier's or certified check payable to the "Treasurer, State of New Jersey". Upon Monsanto's failure to pay a stipulated penalty within thirty (30) calendar days of receipt of a written demand, the assessment of stipulated penalties shall resume at the scheduled rate achieved just prior to the issuance of the demand letter. No payments made pursuant to this section shall be tax deductible.

VI. Force Majeure

58. If any event occurs which Monsanto believes will or may cause delay in the compliance of any provision of this Administrative Consent Order, Monsanto shall notify the Department in writing within seven (7) calendar days of the delay or anticipated delay, as appropriate, referencing this paragraph and describing the anticipated length of the delay, the precise cause or causes of the delay, any measures taken or to be taken to minimize the delay, and the time required to take any such measures to

minimize the delay. Monsanto shall take all necessary action to prevent or minimize any such delay.

59. If the Department finds that: (a) Monsanto has complied with the notice requirements of the preceding paragraph and; (b) that any delay or anticipated delay has been or will be caused by fire, flood, riot, strike or other circumstances beyond the control of Monsanto, the Department shall extend the time for performance hereunder for a period no longer than the delay resulting from such circumstances. If the Department determines that either Monsanto has not complied with the notice requirements of the preceding paragraph, or the event causing the delay is not beyond the control of Monsanto, failure to comply with the provisions of this Administrative Consent Order shall constitute a breach of the requirements of this Administrative Consent Order. The burden of proving that any delay is caused by circumstances beyond the control of Monsanto and the length of any such delay attributable to those circumstances shall rest with Monsanto. Increases in the cost or expenses incurred by Monsanto in fulfilling the requirements of this Administrative Consent Order shall not be a basis for an extension of time. Delay in an interim requirement shall not automatically justify or excuse delay in the attainment of subsequent requirements. Force Majeure shall not include nonattainment of the goals, standards, guidelines and requirements set forth in the appendices attached hereto. Force Majeure shall not include contractor's breach unless due to circumstances beyond the control of the contractor.

VII. Reservation of Rights

60. If Monsanto fails to pay stipulated penalties pursuant to paragraph 56, the Department may institute civil proceedings to collect such penalties or assess civil administrative penalties for the violations of this Administrative Consent Order; the Department may also bring an action in New Jersey Superior Court pursuant to N.J.S.A. 58:10A-10 to enforce the provisions of this Administrative Consent Order.

61. Monsanto's payment of stipulated penalties pursuant to this Administrative Consent Order shall not preclude the Department from electing to pursue any injunctive relief to enforce the terms of this Administrative Consent Order.

62. Nothing in this Administrative Consent Order shall preclude the Department from seeking civil or civil administrative penalties against Monsanto.

63. This Administrative Consent Order shall not be construed to affect or waive the claims of federal or State natural trustees against any party for damages for injury to, destruction of, or loss of natural resources.

64. The Department reserves the right to require Monsanto to take or arrange for the taking of, any and all additional measures should the Department determine that such actions are necessary to protect human health or the environment. Nothing in this Administrative Consent Order shall constitute a waiver of any statutory right of the Department to require Monsanto to undertake such additional measures should the Department determine that such measures are necessary.

VIII. General Provisions

65. This Administrative Consent Order shall be binding on Monsanto, its agents, successors, assignees and any trustee in bankruptcy or receiver appointed pursuant to a proceeding in law or equity.

66. Monsanto shall perform all work conducted pursuant to this Administrative Consent Order in accordance with prevailing professional standards.

67. Monsanto shall conduct all Site operations in accordance with the Health and Safety plan developed for this Site (as set forth in Appendix B) and in such a manner so as to ensure the safety and health of workers so engaged. All Site activities shall be conducted in accordance with all general industry (29 CFR 1910) and construction (29 CFR 1926) standards of the federal Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, as well as any other State or municipal codes or ordinances that may apply. Special attention shall be given to compliance with those requirements set forth in OSHA's interim final rule entitled "Hazardous Waste Operations and Emergency Response", Section 1910.120 of Subpart H of 29 CFR (published December 19, 1986, Volume 51, Number 244, Federal Register), until such time as OSHA's final rule takes effect, at which time OSHA's final rule shall govern.

68. In accordance with N.J.S.A. 45:8-45, all plans or specifications involving professional engineering, submitted pursuant to this Administrative Consent Order, shall be submitted affixed with the seal of a professional engineer licensed pursuant to the provisions of N.J.S.A. 45:8-1 et seq.

69. Monsanto shall conform all actions pursuant to this Administrative Consent Order with all applicable Federal, State, and local laws and regulations. Monsanto shall be responsible for obtaining all necessary permits, licenses and other authorizations required to comply with this Administrative Consent Order.

70. All appendices referenced in this Administrative Consent Order, as well as reports, work plans and documents required under the terms of this Administrative Consent Order are, upon approval by the Department, incorporated into this Administrative Consent Order by reference and made a part hereof.

71. Each field activity to be conducted pursuant to this Administrative Consent Order shall be coordinated by an on-Site professional(s) with substantial experience relative to the particular activity being conducted at the Site each day, such as experience in the area of hydrogeology, geology, environmental controls, risk analysis, health and safety or soils.

72. All work plans, reports and documents required by this Administrative Consent Order shall be prepared, if appropriate, as determined by the Department by a qualified hydrogeologic/engineering firm which can demonstrate at least three (3) years experience in the development and implementation of soils and ground water contamination investigations and remedial actions.

73. Upon the receipt of a written request from the Department, Monsanto shall submit to the Department all data and information concerning pollution at and/or emanating from the Site, or which has emanated from the Site, including raw sampling and monitor data, whether or not such data and information was developed pursuant to this Administrative Consent Order.

74. Upon the receipt of a request from the Department, Monsanto shall make available to the Department all technical records and contractual documents maintained or created by Monsanto or its agents in connection with this Administrative Consent Order.

75. Monsanto shall preserve, during the pendency of this Administrative Consent Order and for a minimum of six (6) years after its termination, all data, records and documents in their possession or in the possession of their divisions, employees, agents, accountants, contractors, or attorneys which relate in any way to the implementation of work under this Administrative Consent Order, despite any document retention policy to the contrary. After this six year period, Monsanto shall notify the Department within thirty (30) days prior to the destruction of any such documents. If the Department requests in writing that some or all of the documents be preserved for a longer time period, Monsanto shall comply with that request. Upon receipt of the written request by the Department, Monsanto shall submit to the Department such records or copies of any such records.

76. No obligations imposed by this Administrative Consent Order with the exception of paragraphs 19, 20 and 56 are intended to constitute a debt, claim, penalty or other civil action which should be limited or discharged in a bankruptcy proceeding. All obligations imposed by this Administrative Consent Order shall constitute continuing regulatory obligations imposed pursuant to the police powers of the State of New Jersey intended to protect human health or the environment.

77. In addition to the Department's statutory and regulatory rights to enter and inspect, Monsanto shall allow the Department and its authorized representatives access to the Site at all times for the purpose of monitoring Monsanto's compliance with this Administrative Consent Order and/or to perform any remedial activities Monsanto fails to perform as required by this Administrative Consent Order.

78. Monsanto agrees to stop or alter remedial activities should the Department determine that Monsanto is not in compliance with the Health and Safety plan developed for this Site.

79. Monsanto shall not construe any informal advice, guidance, suggestions, or comments by the Department, or by persons acting on behalf of the Department, as relieving Monsanto of its obligation to obtain written approvals as required herein, unless the Department specifically relieves Monsanto of such obligations, writing in accordance with the following paragraph.

80. Monsanto agrees not to take any actions or make any use of the Site inconsistent with the remedy at the Site. Monsanto agrees to the imposition of such use and/or access restriction as may be deemed necessary by the Department. The use and access restrictions are to run with the land

and be for the benefit of and enforceable by the Department. Monsanto shall record the restrictions with the Hudson County Clerk immediately upon request of the Department that Monsanto do so.

81. No modification or waiver of this Administrative Consent Order shall be valid except by written amendment to this Administrative Consent Order duly executed by Monsanto and the Department.

82. Monsanto hereby consents to and agrees to comply with this Administrative Consent Order which shall be fully enforceable as an Order in the New Jersey Superior Court upon filing of a summary action for compliance pursuant to N.J.S.A. 13:1D-1 et seq., the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq. and/or the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq.

83. In the event that the Department determines that a public meeting concerning the cleanup of the Site is necessary at any time, Monsanto shall be available and participate in such a meeting upon written notification from the Department of the date, time and place of such meeting.

84. Monsanto waives its rights to an administrative hearing concerning the entry of this Administrative Consent Order pursuant to N.J.S.A. 52:14B-1 et seq. and N.J.S.A. 58:10A-1 et seq.

85. Monsanto shall provide a copy of this Administrative Consent Order to each contractor and subcontractor retained to perform the work required by this Administrative Consent Order and shall condition all contracts and subcontracts entered for the performance of such work upon compliance with the terms and conditions of this Administrative Consent Order. Monsanto shall be responsible to the Department for ensuring that their contractors and subcontractors perform the work herein in accordance with this Administrative Consent Order.

86. Monsanto agrees not to contest the authority or jurisdiction of the Department to issue this Administrative Consent Order; Monsanto further agrees not to contest the terms or conditions of this Administrative Consent Order, except as to interpretation or application of such terms and conditions in any action brought by the Department to enforce the provisions of this Administrative Consent Order. Provided however, that Monsanto expressly reserves its rights, in any judicial or administrative action brought by the Department including any actions pursuant to paragraphs 60, 61 and 82, to contest that any action or requirement or disapproval by the Department was arbitrary, capricious or unreasonable. Also provided that Monsanto expressly reserves the right, entirely at this own risk not to comply with any direction or decision of the Department and to defend itself in any action brought to enforce such direction or decision which Monsanto believes is arbitrary, capricious or unreasonable. In any such enforcement proceedings, Monsanto shall have the burden of proof to establish that any direction or decision of the Department was arbitrary, capricious or unreasonable. In the event that Monsanto prevails in any proceedings in which it is alleged that the Department acted arbitrarily, capriciously or unreasonably, in exercising its right under paragraph 50 above, to draw on the letter of credit, the Department agrees to refund, to the account of the letter of credit, the funds so drawn.

87. Monsanto shall give written notice of this Administrative Consent Order to any successor in interest prior to transfer of ownership of Monsanto's facilities which are the subject of this Administrative Consent Order, and shall simultaneously verify to the Department that such notice has been given. This requirement shall be in addition to any other statutory or regulatory requirements arising from the transfer of ownership of Monsanto's facilities.

88. The requirements of this Administrative Consent Order shall be deemed satisfied upon the receipt by Monsanto of written notice from the Department that Monsanto has demonstrated, to the satisfaction of the Department, that all the terms of this Administrative Consent Order have been completed.

89. Monsanto shall submit to the Department, along with the executed original Administrative Consent Order, the appropriate documentary evidence (such as a corporate resolution) that the signatory for Monsanto has the authority to bind Monsanto to the terms of this Administrative Consent Order.

90. This Administrative Consent Order shall become effective upon the execution by the Department.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Date: _____

Ronald T. Corcory, Assistant Director
Responsible Party Cleanup Element

MONSANTO CHEMICAL COMPANY

Date: _____

By: _____

Name: _____

Title: _____

LIST OF APPENDICES

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APPENDIX A

INTERIM REMEDIAL MEASURES

SCOPE OF WORK

INTERIM REMEDIAL MEASURES

I. Contents of Interim Remedial Measures Plan

- A. A detailed schedule for all interim remedial measures required by this Administrative Consent Order and in this Scope of Work, including:
 - 1. dates for submission of all permit applications
 - 2. dates for start and ending of all field activities
- B. A detailed engineering design for each interim remedial measure including:
 - 1. a description of appropriate new or additional containment, treatment and/or disposal technologies
 - 2. a description of special engineering considerations required to upgrade existing facilities
 - 3. a description of operation, maintenance and monitoring requirements of each interim remedial measures
 - 4. off-Site disposal needs and transportation plans
 - 5. additional temporary or permanent storage requirements
 - 6. safety requirements for interim remedial measures
 - 7. a description of ability of each measure to be phased into individual operable units
 - 8. a review of each measure to ensure compliance with applicable statutes and regulations
 - 9. a list of all Federal, State and local permits required for each measure
 - 10. a discussion of any limits or constraints each measure may place on final remedial alternatives
- C. A detailed performance evaluation program

APPENDIX C

QUALITY ASSURANCE REQUIREMENTS

QUALITY ASSURANCE DELIVERABLE REQUIREMENTS

There are three parts to this Appendix. The first part outlines, according to sample/data type, frequency and use, the approximate percentage of samples for which the Tier I and Tier II quality assurance deliverables are required. The second part is a copy of the Tier I Quality Assurance Deliverable Requirements. The third part is a copy of the Tier II Quality Assurance Deliverable Requirements.

CRITERIA FOR QUALITY ASSURANCE DELIVERABLE REQUIREMENTS

| | <u>TIER I</u> | <u>TIER II</u> |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------|
| A. <u>Remedial Investigation:</u> | | |
| 1. initial RI phase | 100% | |
| 2. subsequent RI phases | 10%, or minimum
of one monitor
well, or one sample
per sampling event | 90% |
| B. <u>Remedial Action:</u> | | |
| 1. monitoring of decontamination
effectiveness | | |
| a. initial sampling | 100% | |
| b. subsequent sampling | 25% | 75% |
| 2. sampling to support
proposal to terminate
decontamination system | 100% | |
| 3. post cleanup/removal
soil sampling to determine
if any additional cleanup/
removal is required | 100% | |
| C. <u>Other Site Specific Considerations:</u> | | |
| 1. <u>potable water</u> | | |
| a. initial sampling | 100% | |
| b. subsequent sampling | 25% | 75% |

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APPENDIX D

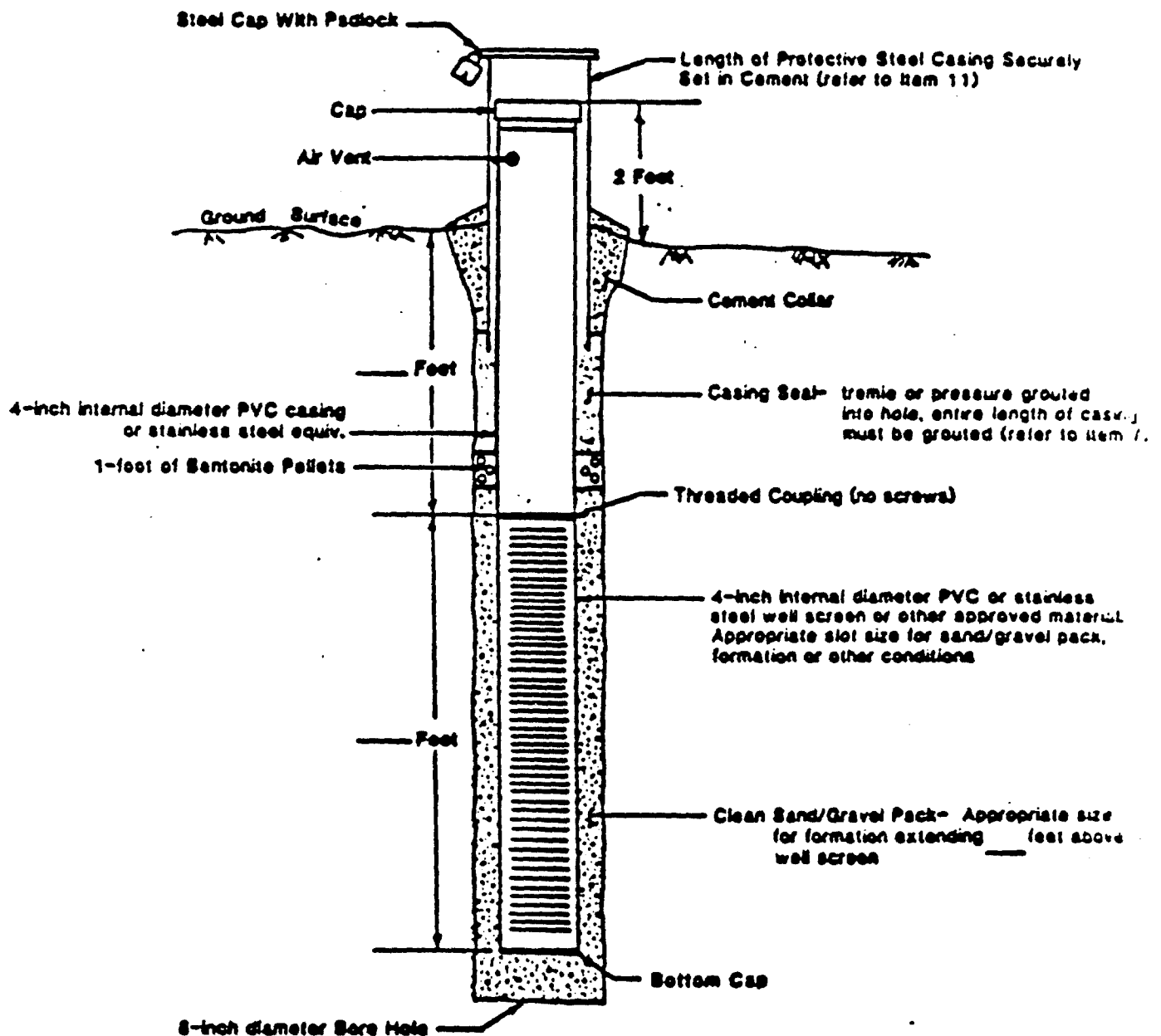
MONITOR WELL SPECIFICATIONS

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION MONITOR WELL SPECIFICATIONS FOR UNCONSOLIDATED FORMATIONS

SITE NAME: _____

LOCATION: _____

DATE: _____



NOT TO SCALE

MONITORING WELL REQUIREMENTS FOR UNCONSOLIDATED FORMATIONS
Revised 9/87

1. Notification to the NJDEP is required two weeks prior to drilling.
2. State well permits are required for each monitoring well constructed by the driller. The well permit tag must be permanently affixed to each monitoring well.
3. Copies of the site specific well specifications must be maintained at the drilling site by the driller.
4. The monitoring well must be installed by a New Jersey licensed well driller.
5. Monitoring well design must conform with NJAC 7:9-7, 8, and 9.
6. The borehole diameter must be a minimum of 4 inches greater than the casing diameter.
7. Acceptable grouting materials are:
 - Neat Cement - 6 gallons of water per 94 pound bag of cement.
 - Granular Bentonite - 1 gallon of water per 1.5 pounds of bentonite.
 - Cement-Bentonite - 8 gallons of water to 5 pounds of bentonite dry mixed per 94 pound bag of cement.
 - Cement-Bentonite - 10 gallons of water per 8 pounds of bentonite water-mixed with a 94 pound bag of cement.
 - Non-expandable cement - 7.5 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 4 pounds of bentonite and 94 pounds of cement.
 - Non-expandable cement - 7 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 94 pounds of cement (Type I or Type II).
8. Potable water must be used for mixing grouting materials and drilling fluids.
9. Only threaded joints are acceptable as couplings.
10. The driller must maintain an accurate written log of all materials encountered, record construction details for each well, and record the depths water bearing zones. This information must be submitted to the Bureau of Water Allocation as required by N.J.S.A. 58:4A.
11. A length of protective steel casing with a locking cap must be securely set in cement around the well casing. Flush mount monitoring wells are acceptable provided they have manholes, locking caps, and seals to prevent leakage of surface water into the well.

12. Top of each well casing (excluding cap) must be surveyed to the nearest 0.01 foot by a New Jersey licensed surveyor. The survey point must be marked on each well.

13. Wells must be developed to a turbidity-free discharge.

14. Modifications to designs are allowed only with NJDEP approval.

Additional Requirements (if checked):

Split Spoon Samples () _____

Borehole Geophysical Logs () _____

Top of Screen set _____ feet above/below water table

Dedicated Bailer (Sampler) in Well () _____

Other () _____

Notice is Hereby Given of the Following:

Review by the Department of well locations and depths is limited solely to review for compliance with the law and Department rules.

The Department does not review well locations or depths to ascertain the presence of, nor the potential for, damage to any pipeline, cable, or other structures.

The permittee (applicant) is solely responsible for the safety and adequacy of the design and construction of monitoring well(s) required by the Department.

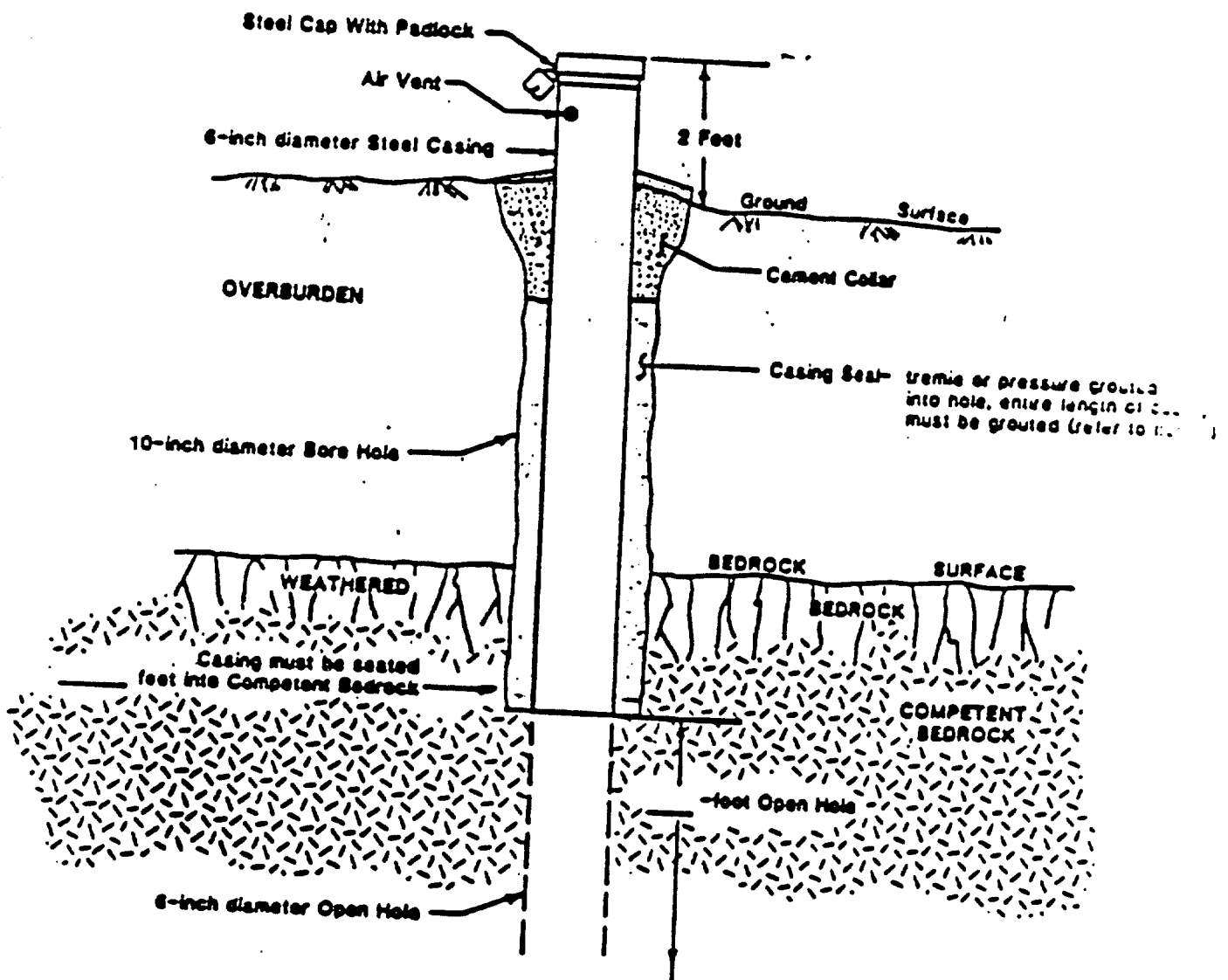
The permittee (applicant) is solely responsible for any harm or damage to person or property which results from the construction or maintenance of any well; this provision is not intended to relieve third parties of any liabilities or responsibilities which are legally theirs.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION MONITOR WELL SPECIFICATIONS FOR BEDROCK FORMATIONS

SITE NAME: _____

LOCATION: _____

DATE: _____



NOT TO SCALE

BEDROCK MONITORING WELL REQUIREMENTS
Revised 9/87

1. Notification to the NJDEP is required two weeks prior to drilling.
- 2. State well permits are required for each monitoring well constructed by the driller. The well permit tag must be permanently affixed to each monitoring well.
3. Copies of the site specific well specifications must be maintained at the drilling site by the driller.
4. The monitoring well must be installed by a New Jersey licensed well driller.
5. Monitoring well design must conform with NJAC 7:9-7, 8, and 9.
6. Drill an oversize borehole a minimum of 4 inches greater than the casing diameter through the overburden and bedrock so that the casing can be sealed into competent rock as indicated in the diagram.
7. Acceptable grouting materials are:
 - Neat Cement - 6 gallons of water per 94 pound bag of cement.
 - Granular Bentonite - 1 gallon of water per 1.5 pounds of bentonite.
 - Cement-Bentonite - 2 gallons of water to 5 pounds of bentonite dry mixed per 94 pound bag of cement.
 - Cement-Bentonite - 10 gallons of water per 8 pounds of bentonite water-mixed with a 94 pound bag of cement.
 - Non-expandable cement - 7.5 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 4 pounds of bentonite and 94 pounds of cement.
 - Non-expandable cement - 7 gallons of water per 1/2 teaspoon of aluminum hydroxide mixed with 94 pounds of cement (Type I or Type II).
8. Potable water must be used for mixing grouting materials and drilling fluids.
9. Only threaded or welded joints are acceptable as couplings.
10. The driller must maintain an accurate written log of all materials encountered, record construction details for each well, and record the depth of water bearing zones. This information must be submitted to the Bureau of Water Allocation as required by N.J.S.A. 58:4A.
11. Flush mount monitoring wells are acceptable provided they have manholes, locking caps, and seals to prevent leakage of surface water into the well.

12. Top of each well casing (excluding cap) must be surveyed to the nearest 0.01 foot by a New Jersey licensed surveyor. The survey point must be marked on each well:

13. Wells must be developed to a turbidity-free discharge.

14. Modifications to designs are allowed only with NJDEP approval.

Additional Requirements (if checked):

Rock Core Samples () _____

Split Spoon Samples () _____

Borehole Geophysical Logs () _____

Dedicated Bailer (Sampler) in Well () _____

Other () _____

Notice is Hereby Given of the Following:

Review by the Department of well locations and depths is limited solely to review for compliance with the law and Department rules.

The Department does not review well locations or depths to ascertain the presence of, nor the potential for, damage to any pipeline, cable, or other structures.

The permittee (applicant) is solely responsible for the safety and adequacy of the design and construction of monitoring well(s) required by the Department.

The permittee (applicant) is solely responsible for any harm or damage to person or property which results from the construction or maintenance of any well; this provision is not intended to relieve third parties of any liabilities or responsibilities which are legally theirs.

APPENDIX E

FEASIBILITY STUDY
SCOPE OF WORK

FEASIBILITY STUDY SCOPE OF WORK

I. Requirements of Feasibility Study

- A. Identify and list all potentially viable remedial action alternatives for the pollution at and/or emanating from the Site
- B. Develop alternatives to incorporate remedial technologies into a comprehensive, Site-specific approach
- C. Evaluate and compare remedial action alternatives
- D. Recommend the most environmentally sound remedial action alternatives which will, in a timely manner:
 1. cleanup pollution at the site, emanating from the site, or which has emanated from the site
 2. achieve and maintain applicable air, soil, surface-water and ground-water quality standards (eg., N.J.A.C. 7:14A-1 et seq., 7:9-4, 7:9-6), and applicable guidelines established by the Department, alternative concentration limits proposed by Monsanto or return the area to background conditions. The intent of this provision is not to prioritize guidelines, standards, background conditions and alternative concentration limits, but to ensure that adequate consideration and focus is given to remedial alternatives which achieve and maintain applicable guidelines and standards. NJDEP does not want Monsanto to focus on alternatives to the exclusion of remedial approaches which achieve standards and guidelines.
 3. remedy damage to and provide adequate protection of human health and the environment

II. Contents of Feasibility Study Work Plan

- A. A statement of the requirements for the feasibility study pursuant to Section I., above
- B. A detailed schedule for all feasibility study activities including
 1. schedule of key interim dates in feasibility study
 2. dates for submission of all permit applications required for completion of feasibility study
 3. date for submitting feasibility study report to the Department
- C. A list of all potentially viable remedial action alternatives to be considered
- D. A presentation of initial screening procedures in accordance with the following:

1. screen all potentially viable remedial action alternatives to narrow the list of potential alternatives for further detailed analysis
 2. initial screening criteria
 - a. environmental and human health impacts
 - b. engineering feasibility and reliability
 3. all alternatives capable of remediating the environmental and human health concerns at and/or emanating from the Site shall be retained
- E. A presentation of characteristics to be used to describe remedial action alternatives remaining after initial screening in accordance with the following:
1. describe appropriate treatment and disposal technologies, as well as any permanent facilities required
 2. specify engineering considerations required to implement the alternative (e.g., treatability study, pilot treatment facility, additional studies needed to proceed with final remedial design)
 3. describe environmental and human health impacts and propose methods for mitigating or eliminating any adverse impacts
 4. describe operation and maintenance/monitoring requirements of the completed remedy
 5. describe off-Site disposal needs and transportation plans
 6. describe temporary storage requirements
 7. describe requirements for health and safety plans during remedial implementation (including both on-Site and off-Site health and safety considerations)
 8. describe how the alternative could be phased into individual operable units, including how various components of the remedy could be implemented individually or in groups resulting in a functional phase of the overall remedy
 9. describe how the alternative could be segmented into areas to allow implementation of differing phases of the alternative
 10. describe how alternatives could be combined to create more effective alternatives
 11. describe which Federal, State and local permits would be necessary for each alternative identified and outline the information necessary for the development of each of the permit applications

12. describe the time required for implementation, including significant interim dates

F. A detailed discussion of procedures to evaluate and compare the remedial action alternatives that remain after the initial screening in accordance with the following:

1. evaluate each alternative in accordance with the requirements referenced in I. D., above, and the following characteristics:

- i. level of cleanup achievable
- ii. time to achieve cleanup
- iii. feasibility
- iv. implementability
- v. reliability
- vi. ability to minimize adverse impacts during action
- vii. ability to minimize off-Site impacts caused by action
- viii. useability of ground water after implementation of alternative
- ix. useability of surface water after implementation of alternative
- x. useability of Site after implementation of alternative
- xi. legal constraints

2. compare each alternative in accordance with the requirements and characteristics identified in II. F. 1. above

G. Presentation of procedure concerning recommendation of remedial action alternatives in accordance with the following:

1. based on the detailed evaluation process, recommend the most environmentally sound remedial action alternatives which will, in a timely manner, meet the requirements in I. D. above

2. prepare a detailed rationale for recommending the remedial action alternatives, stating the advantages over other alternatives considered

3. prepare a conceptual design of the recommended alternatives including:

- a. engineering and hydrogeologic approaches
- b. implementation schedules
- c. any special implementation requirements
- d. applicable design criteria
- e. preliminary Site layout(s)
- f. operation and maintenance requirements

g. safety plan(s)

III. Content of Feasibility Study Report

- A. Detailed discussion of initial screening of remedial action alternatives according to the approved FS Work Plan .
- B. Detailed description of remedial action alternatives that remain after initial screening according to the approved FS Work Plan
- C. Detailed evaluation and comparison of remedial action alternatives based on the descriptions presented pursuant to the approved FS Work Plan
- D. Recommendation of, rationale for the most environmentally sound remedial alternatives which meets the requirements in Section I. D., above, in a timely manner and according to the approved FS Work Plan
- E. Conceptual design of recommended remedial alternatives
- F. List all references used in feasibility study

APPENDIX F

REMEDIAL ACTION
SCOPE OF WORK

REMEDIAL ACTION SCOPE OF WORK

- I. Detailed Engineering Design
- II. Schedule for Construction, Operation and Maintenance
- III. Operation, Maintenance, Monitoring and Reporting Requirements
- IV. Performance Evaluation
 - A. The selected remedial action alternative shall meet or exceed the Requirements of the Feasibility Study in Appendix E, item I.D.
 - B. Procedure
 - 1. during implementation of ground water aspect of the alternative, the recovery wells' radius of influence shall adequately be recovering all polluted ground water
 - a. adequate performance evaluation monitoring
 - b. submission of monitoring data
 - i. ground water quality contour map(s)
 - ii. ground water elevation contour map(s)
 - iii. time/concentration graphs for all recovery wells and all monitor wells
 - iv. time/volume pumped per month histogram for all recovery wells
 - 2. post cleanup sampling
 - a. soil
 - b. ground water
 - c. surface water and sediment
- V. Complete and Detailed Cost Estimate

APPENDIX G

LETTER OF CREDIT WORDING

_____, 19__

Commissioner
NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION
CN 402
Trenton, New Jersey 08625

Dear Sir:

We hereby establish our Irrevocable Standby Letter of Credit No. _____
in your favor, at the request and for the account of
_____ Monsanto name and address _____ up to
the aggregate amount of _____
_____ amount written out _____ U.S. Dollars (
\$ amount _____), available upon presentation by you of:

- (1) Your sight draft, bearing reference to this letter of credit
No. _____, and
- (2) Your signed statement reading as follows: "I certify that the
amount of the draft is payable pursuant to the terms and
provisions of the _____, 19__ Administrative Consent
Order between the New Jersey Department of Environmental
Protection and
_____ Monsanto _____".
- (3) proof of receipt by _____ Monsanto _____, at least 15 calendar
days prior to presentation of said letter of certification to
the bank, of a registered letter notifying
_____ Monsanto _____ of the Department's intent to draw on
funds pursuant to this Irrevocable Letter of Credit.

This letter of credit is effective as of _____, 19__ and shall
expire on _____, 19__ and shall not be automatically renewable but
shall be renewable upon reapplication and review only.

Whenever this letter of credit is drawn on under and in compliance with
the terms of this credit, we shall duly honor such draft upon presentation
to us, and we shall deposit the amount of the draft directly into the
standby trust fund of _____ Monsanto _____ in accordance with your
instructions.

This credit is subject to the most recent edition of the Uniform Customs
and Practice for Documentary Credits, published by the International Chamber
of Commerce and the laws of the State of New Jersey.

As a condition of this credit, _____ Monsanto _____ is hereby required
to renew this letter of credit by _____, 19__ (date to be inserted is
60 calendar days from expiration date of this letter of credit).

If _____ Monsanto _____ does not renew the letter of credit by
_____, 19__ (same date as proceeding paragraph), we shall advise you in

writing no later than _____, 19__ (date to be inserted is 45 calendar days prior to expiration date of letter of credit) that
_____ Monsanto _____ has not reviewed the letter of credit.

If _____ Monsanto _____ does not renew this letter of credit by _____, 19__, (60 calendar days prior to expiration) we will deposit the full amount of the letter of credit into the standby trust fund of _____ Monsanto _____ no later than _____, 19__ (14 calendar days prior to expiration) and we will notify you in writing by _____, 19__ (7 calendar days prior to expiration) that we did in fact deposit the full amount of the letter of credit.

APPENDIX H

STANDBY TRUST AGREEMENT WORDING

TRUST AGREEMENT

Trust Agreement, "Agreement", entered into as of
 (date) by and between Monsanto known as "Grantor"
 and
 issuing institution the "Trustee".

Whereas, the New Jersey Department of Environmental Protection, "NJDEP", an agency of the State of New Jersey, has entered into an Administrative Consent Order with Grantor dated _____, 19__, a copy of which is annexed hereto as Schedule "A", pursuant to which Grantor is obligated to establish a trust fund to assure the availability of funds to secure the performance of Grantor's obligations under that Administrative Consent Order.

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee.

Now, Therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

- (a) The term "Grantor" means Monsanto who enters into this Agreement and any successors or assigns of the Grantor.
- (b) The term "Trustee" means the Trustee who enters into the Agreement and any successor Trustee, who has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or New Jersey agency. The name, address, and title of the Trustee is:

- (c) The term "Commissioner" means the Commissioner of the New Jersey Department of Environmental Protection.
- (d) The term "Beneficiary" means the New Jersey Department of Environmental Protection.
- (e) The term "NJDEP" means the New Jersey Department of Environmental Protection.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule "A".

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund", for the benefit of NJDEP. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule "B", attached hereto. Such property and any other property subsequently

transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as herein provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the NJDEP.

Section 4. Payment for Performance of Administrative Consent Order

The Trustee shall make payment from the Fund as the NJDEP Commissioner shall direct, in writing, to provide for the payment of the costs of performing Grantor's obligations under the _____, 19__ Administrative Consent Order (annexed hereto as Schedule "A"). The Trustee shall reimburse the Grantor or other persons, as specified by NJDEP, in such amounts as the NJDEP shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts, as the NJDEP specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund, as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling and managing the Fund, the Trustee shall discharge his/her duties with respect to the Trust fund solely in the interest of the beneficiary and with the care, skill, prudence and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

- (i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities or any of their affiliates, as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;
- (ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

- (iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

- (a) To transfer from time to time any or all of the assets of the Fund to any common, commingled or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and
- (b) To purchase shares in any investment Monsanto registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

- (a) To sell, exchange, convey, transfer or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expedience of any such sale or other disposition;
- (b) To make, execute, acknowledge and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;
- (c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person or to deposit or arrange for the deposit of any securities issued by the United States Government or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all time show that all securities are part of the Fund;
- (d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in

its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and

- (e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 calendar days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the NJDEP a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 calendar days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 calendar days after the statement has been furnished to the Grantor and the NJDEP shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any questions arising as to the construction of this Agreement of any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services, as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason, the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the NJDEP and the present Trustee by certified mail 10 calendar days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Schedule "C". The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests and instructions. All orders, requests, and instructions by the NJDEP to the Trustee shall be in writing, signed by the NJDEP Commissioner or his/her designee and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or NJDEP hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests and instructions from the Grantor and/or NJDEP, except as provided for herein.

Section 15. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee and the NJDEP or by the Trustee and the NJDEP if the Grantor ceases to exist.

Section 16. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement, as provided in Section 15, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee and the NJDEP or of the Trustee and the NJDEP, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 17. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust or in carrying out any directions by the Grantor or the NJDEP issued in accordance with this Agreement. The Trust shall be indemnified and saved harmless by the Grantor or the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 18. Choice of Law. This Agreement shall be administered, construed and enforced according to the laws of the State of New Jersey.

Section 19. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers, duly authorized, and their corporate seals to be hereunto affixed and attested, as of the date first above written:

(Signature of Grantor/Title)

ATTEST:

[Title/Seal]

(Signature of Trustee)

ATTEST:

[Title/Seal]

SCHEDULE A

Instructions to the Grantor:

Include here a copy of the Administrative Consent Order.

SCHEDULE B

Instructions to the Grantor:

Include here the initial amount of money the Administrative Consent Order requires you to deposit in the irrevocable standby trust fund.

\$ _____ in cash (may say \$0.00 if necessary)

SCHEDULE C

Instructions to the Grantor:

Include here the required information of your designee for communications with the Trustee.

individual's name, title

Monsanto

CERTIFICATION OF ACKNOWLEDGEMENT

State of

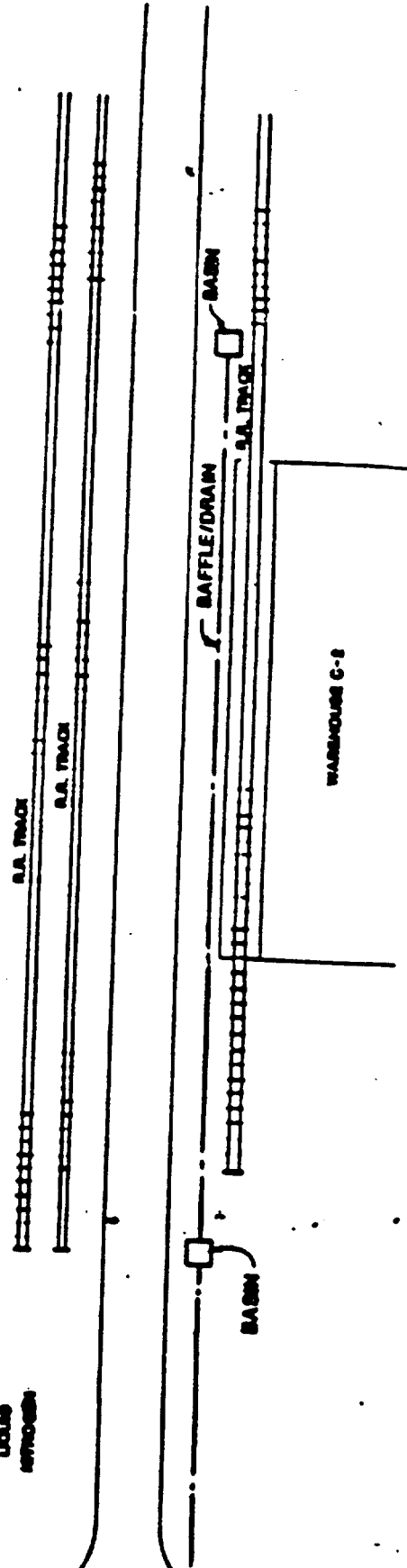
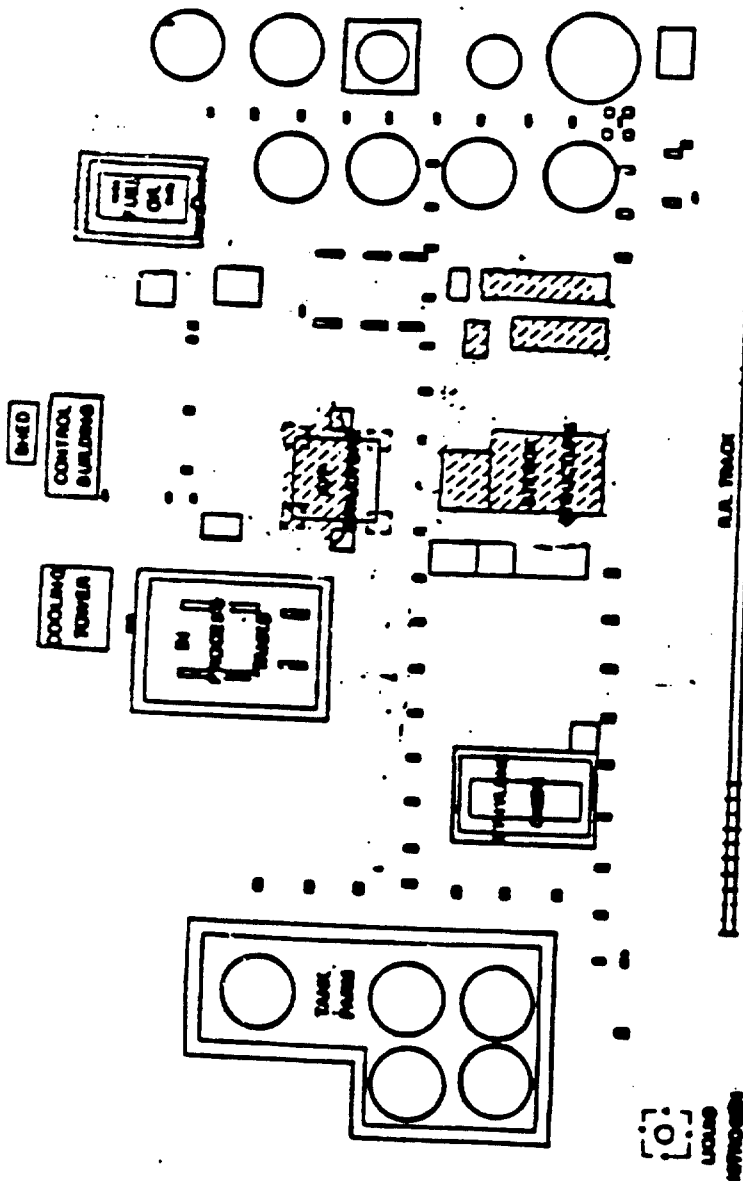
County of

On this ____ day of _____, 19__, before me personally came
____ (name) ____ to me known, who being by me duly sworn, did depose and
say that she/he resides at _____, that she/he
is

____ (title) ____ of _____ Monsanto _____, the corporation described in
and which executed the above instrument; that she/he knows the seal of said
corporation; that the seal affixed to such instruments is such corporate
seal; that it was so affixed by order of the Board of Directors of said
corporation, and that she/he signed her/his name thereto by like order.

(Notary Public)

ATTACHMENT A



SCALE
0 50' 100'

850131501



State of New Jersey
Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028

John M. Fox
Acting Commissioner

Karl J. Delaney
Director

NOV 18 1993

Celso A. Balan, Site Manager
Monsanto Chemical Company
Pennsylvania Avenue
Kearny, New Jersey 07032

Dear Mr. Balan:

RE: Monsanto Chemical Company, Kearny, Hudson County (Monsanto)
Preliminary Remedial Action Workplan (RAWP), August 4, 1993
Administrative Consent Order (ACO) executed on July 24, 1989

The New Jersey Department of Environmental Protection and Energy (Department or NJDEPE) has reviewed the abovementioned document prepared by Roux Associates on behalf of Monsanto Chemical Company, and hereby approves said document provided that the following comments are addressed in the Final RAWP through a response letter.

COMMENTS

1. Section 5.0 - Item 4. Applicable Remediation Standards - page 7

In order to clearly indicate that the cleanup levels are site-specific for Monsanto Kearny only, the second sentence in the first bullet item should read "...An ACS for surface soils of 25 parts per million (ppm) total PCBs is the approved and applicable site-specific remediation standards for this non-residential area where engineering and institutional controls will be employed..."

2. Section 9.3 - Dewatering Permits/short Term water Use Permit - page 18

This section states that a Short Term Water Use Permit would be required for the dewatering activities at rates of less than 70 gallons per minute (gpm) or less than 100,000 gallons per day (gpd), conducted in less than 14 days. The Department does

850131503

not require a permit for pumping rates of less than 70 gpm or 100,000 gpd, regardless of the duration. If the discharge is greater than 70 gpm or 100,000 gpd, one of two permits would be required. Discharges equal to or less than 30 days require a Short Term Water Use Notification; discharges equal to or greater than 31 days require a Dewatering Diversion Permit (a.k.a. Water Allocation Permit).

3. Section 9.4 - Water Treatment - pages 18 and 19

A NJPDES Discharge to Ground Water permit is applicable for the dewatering operation. However, the Department is able to issue a permit waiver for these temporary dewatering activities. A Treatment Works approval (TWA) waiver can also be issued by the Department concurrently with the dewatering waiver. This option would be preferable to obtaining a NJPDES Discharge to Surface Water (DSW) permit, POTW or other Off-site Treatment Facility approval. The recharge of treated ground water must remain on-site and not further degrade the ground water in other portions of the site. The water extracted from the excavation can be treated for PCBs to non-detect and consequently discharged onto the ground surface on-site. Separate phase product collected, if any, must be disposed of properly.

4. Table 3 - Remedial Action Cost Estimate -

The annual operation, maintenance and monitoring costs must be provided as per the Technical Requirements for Site Remediation N.J.A.C. 7:26E et seq. (Technical Requirements), specifically N.J.A.C. 7:26E-5.2(c)4.ii. This cost estimate would also include operation and maintenance associated with the engineering controls (i.e., asphalt cap). In addition, the net present value of capital and operation, maintenance and monitoring costs needs to be provided as per N.J.A.C. 7:26E-5.2(c)4.iii.

5. Figure 11 - Proposed Backfill Materials -

The proposed backfill material for depths above and below the peat layer (i.e., 2" crushed gravel) is unacceptable. As per the Technical Requirements N.J.A.C. 7:26E-6.4(b)2.i, "... the fill material shall be of equal or less permeability than the soil removed."

6. Appendix D - Quality Assurance Project Plan - (QAPP)

A flow chart detailing the project organization and responsibilities shall be provided as per the Technical Requirements N.J.A.C. 7:26E-2.2(a), this plan should include all key personnel, contractors and sub-contractors.

a) Page D-3, Subsection 1.3 - Current Status -

See comment number one above.

b) Page D-4, Subsection 1.4 - Project Objectives and Scope -

An Analytical Methods/Quality Assurances Summary Table shall be provided as per 7:26E-2.2(a) of the Technical Requirements.

Data Deliverables - The QAPP states that at a minimum the data will be reported in a NJDEPE reduced deliverable format. In addition, it is stated that 25% of all data collected will be reported in NJDEPE CLP I full deliverables package. According to the Technical Requirements N.J.A.C. 7:26E-2 the NJDEPE CLP I full deliverables package is not required. However, if 25% of all samples submitted with non-CLP full deliverables package, this would increase the confidence of the soil data, especially when determining the site-specific cleanup levels (i.e., 25 ppm surface soils and for 100 ppm subsurface soils).

Data Validation - The QAPP indicates that the analytical data will be validated by Monsanto and a report will be submitted to the department along with the results. Monsanto must provide a discussion regarding their data validation procedures.

c) Page D-6, Subsection 1.5 - Data Quality Objectives -

There appears to be a typographical error in the last sentence. The sentence should read "...Approximately 25% of the laboratory analytical will be completed at DQO Level IV..."

d) Page D-11, Subsection 4.1.2- Soil Sampling Procedures -

Trip blanks are not required for soil samples being analyzed for PCBs.

Celso A. Balan
Monsanto Chemical Company

e) **Page D-14, Subsection 4.2.1 - Field QC Sample Type and Collection Procedures -**

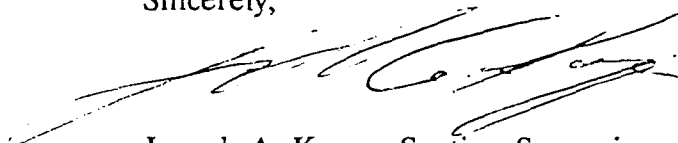
Since ground water samples will be analyzed for PCBs only, again trip blanks are not required for aqueous samples.

f) **Page D-17, Subsections 4.3 and 4.4 -**

Subsection 4.3 states that sample bottles will arrive at the site the day before the planned sampling event, however, subsection 4.4 states that they will arrive the day of sampling. This contradiction should be cleared up before sampling is to begin.

As the actual start date approaches the Department must receive an anticipated schedule for the various field activities, sampling and receipt of analytical results should also be included. If you have any questions regarding this correspondence, please contact the case manager, Mr. Glenn Savary at (609) 633-0719.

Sincerely,



Joseph A. Karpa, Section Supervisor
Bureau of State Case Management

c: Greg Martin, Roux Associates
Glenn Savary, BSCM
Steve Byrnes, BEERA
David VanEck, BGWPA
CHRON

RPCE\HECI\MONSA12.GRS



850131507

State of New Jersey
Department of Environmental Protection and Energy

Robert C. Shinn, Jr.
Commissioner

MAR 28 1994

Celso A. Balan, Site Manager
Monsanto Chemical Company
Pennsylvania Avenue
Kearny, New Jersey 07032

Dear Mr. Balan:

**RE: Monsanto Chemical Company, Kearny, Hudson County (Monsanto)
Response to NJDEPE November 18, 1993 Comments, received December 23, 1993
Discharge to Ground Water Permit and Treatment Works Approval Waiver
Administrative Consent Order (ACO) executed on July 24, 1989**

The New Jersey Department of Environmental Protection and Energy (Department or NJDEPE) has reviewed the abovementioned document and hereby approves the revised Remedial Action Work Plan (RAWP). The NJDEPE has outlined the following conditions in order for Monsanto to obtain a NJPDES-DGW and TWA waiver as per Monsanto's verbal request of March 9, 1994 and written requests of March 17, 1994 and March 22, 1994.

The Department authorizes the discharge of the ground water generated during dewatering of the three Areas of Concern (AOCs), as proposed in the RAWP, for contaminated soil excavation at the above referenced site. The NJDEPE understands that the proposed dewatering activities is an appropriate method to efficiently prepare the contaminated soils within and below the affected underlying aquifers to eliminate excess moisture. This process will be done consequently to the installation of sheet piling firmly keyed into the underlying impermeable layer around the perimeter of each AOC.

The proposed discharge to ground water and treatment works is approved provided that the following conditions are met:

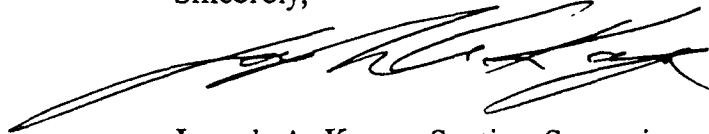
- 1) The ground water discharge remains within the confines of the existing infiltration trench. An alternative infiltration trench may be selected if conditions warrant it.
- 2) If free floating product is encountered during the excavation, the free floating product must first be discharged directly into an oil/water separator.

Celso A. Balan
Monsanto Chemical Company

- 3) The ground water flow rates should not exceed 70 gallons per minute or 100,000 gallons per day.
- 4) The protocols outlined in the March 22, 1994 letter must be followed to assure that flooding and migration to surface water bodies does not occur.

If for some reason that the above conditions cannot be met, please immediately notify the Department in writing detailing any substantial deviations from the above conditions. Should you have any questions regarding this correspondence, please contact the case manager, Mr. Glenn Savary of my staff at (609) 633-0719.

Sincerely,



Joseph A. Karpa, Section Supervisor
Bureau of State Case Management

c: Peter Palko, Roux Associates
Glenn Savary, BSCM
David VanEck, BGWPA
Steve Byrnes, BEERA
CHRON

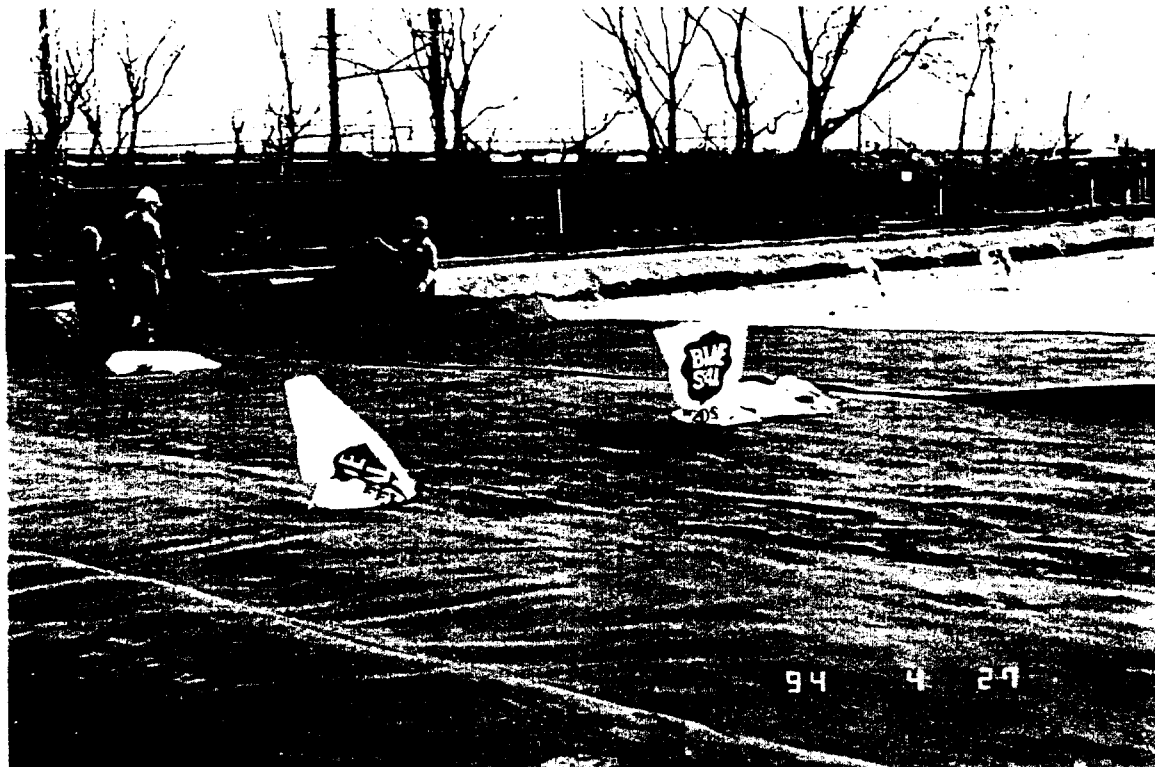
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1. INSTALLATION OF CONSTRUCTION SUPPORT FACILITIES
AND TEMPORARY CONTROLS.



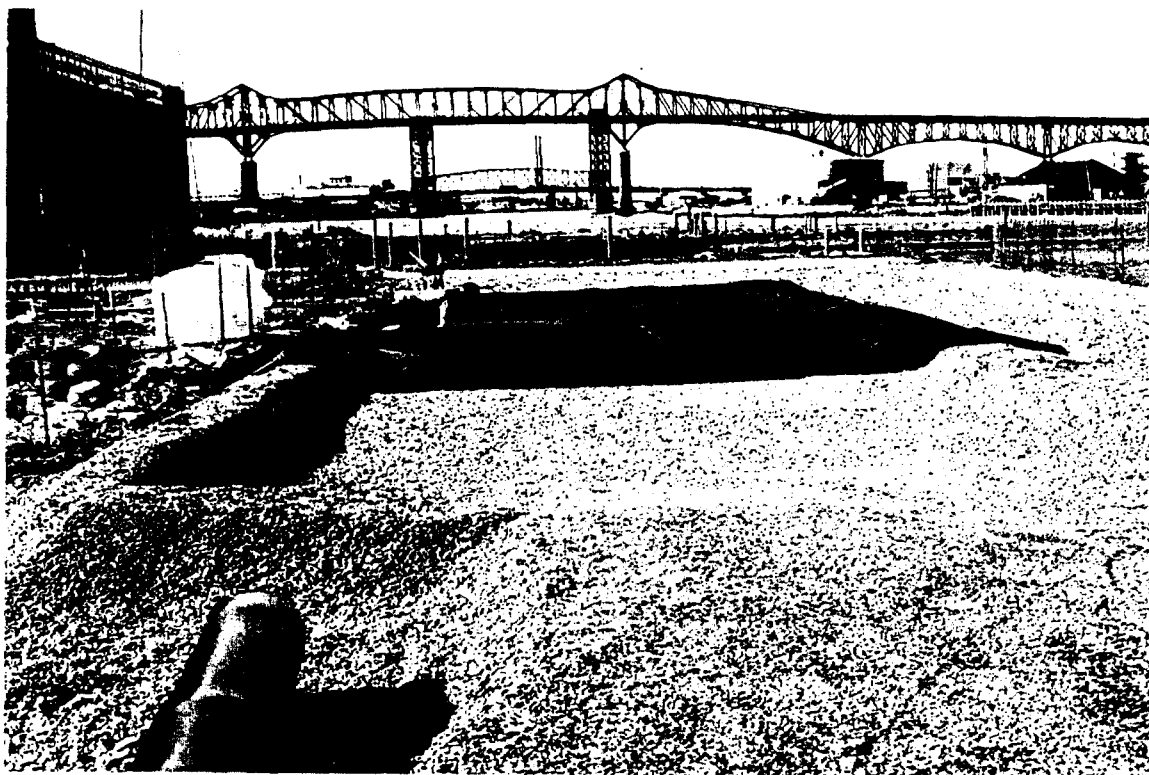
2. MOBILIZATION OF EQUIPMENT AND MATERIALS.



3. INSTALLATION OF GEOTEXTILE FELT IN SOIL HANDLING AREA.



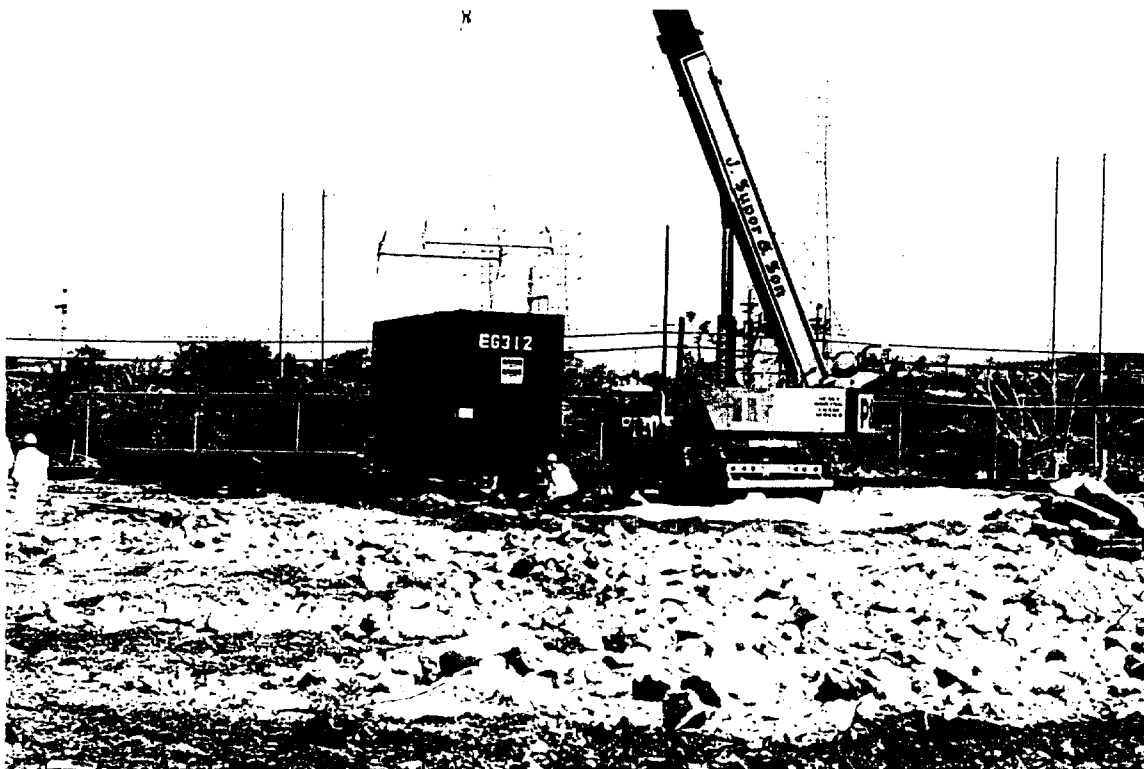
4. INSTALLATION OF 60 MIL HDPE LINER IN SOIL HANDLING AREA.



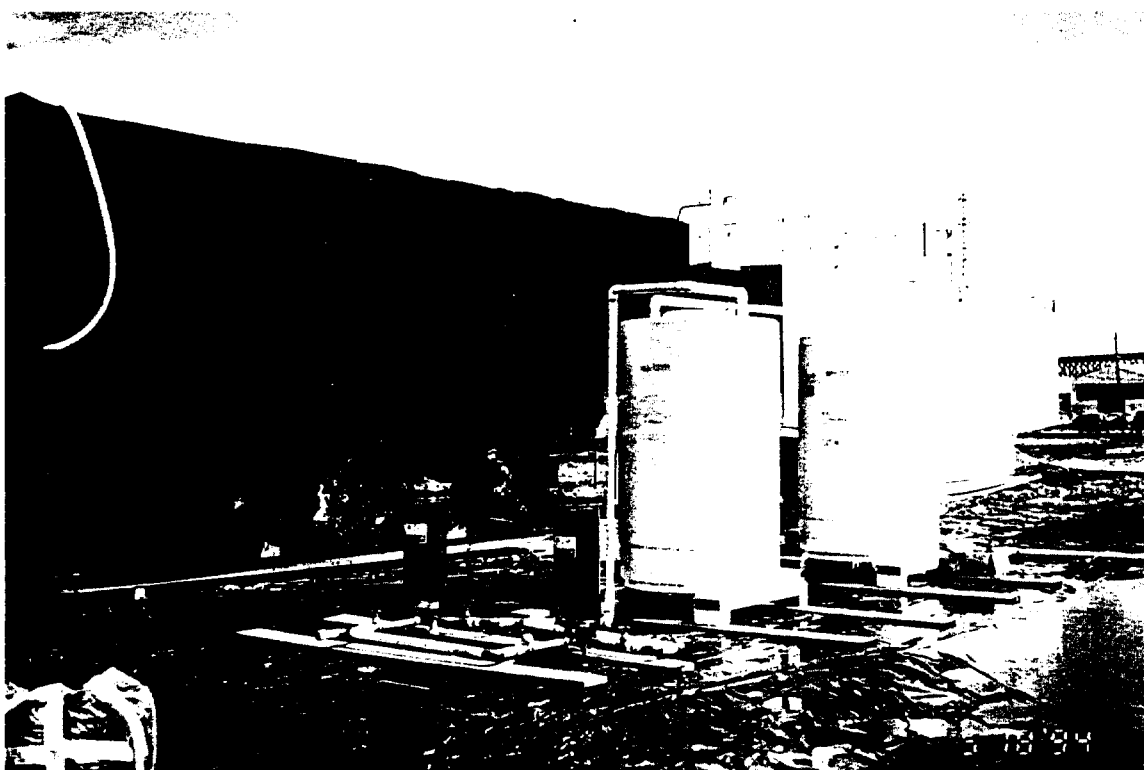
5. CONSTRUCTION OF DECONTAMINATION PAD.



6. DEMOLITION OF EXISTING CONCRETE FOUNDATIONS.



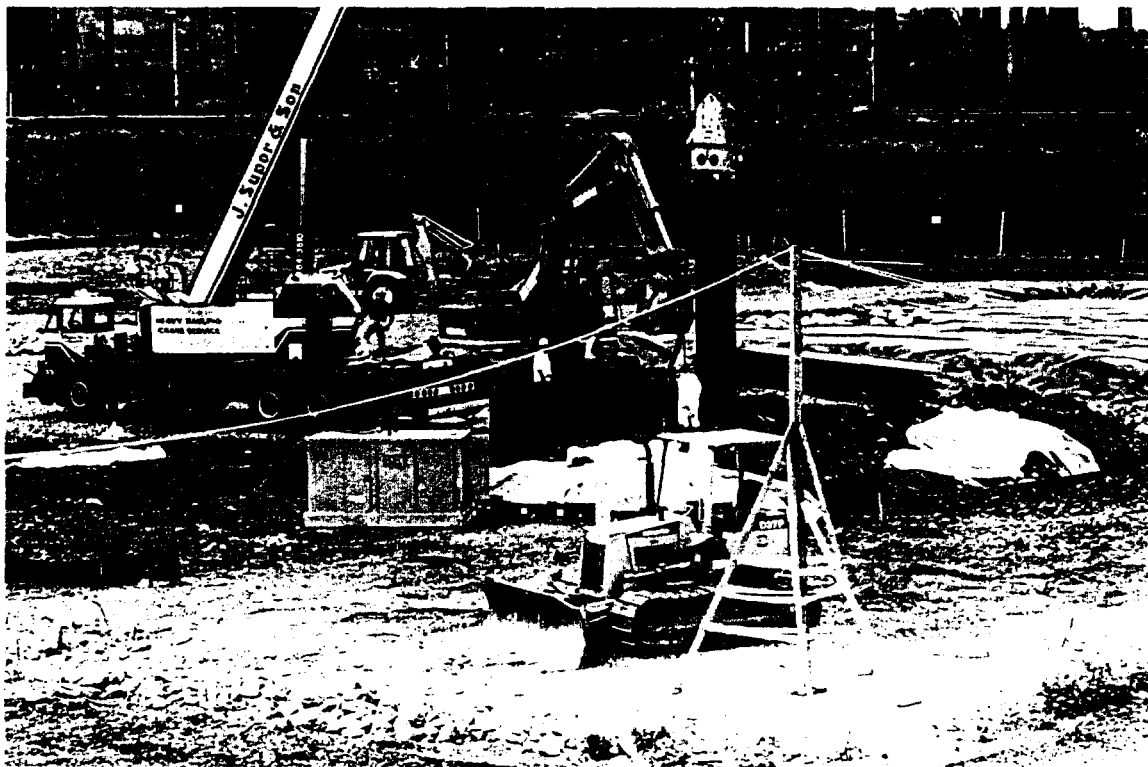
7. INSTALLATION OF 21,000-GALLON STORAGE TANK FOR
WATER TREATMENT SYSTEM.



8. INSTALLATION OF BAG FILTERS AND CARBON UNITS IN
WATER TREATMENT SYSTEM.



9. DECONTAMINATION OF HYDRAULIC RAM.



10. INSTALLATION OF STEEL SHEET PILING AT APSS AREA OF CONCERN.



11. DRILLING ACTIVITIES FOR INSTALLATION OF DEWATERING WELL
IN APSS AREA OF CONCERN.



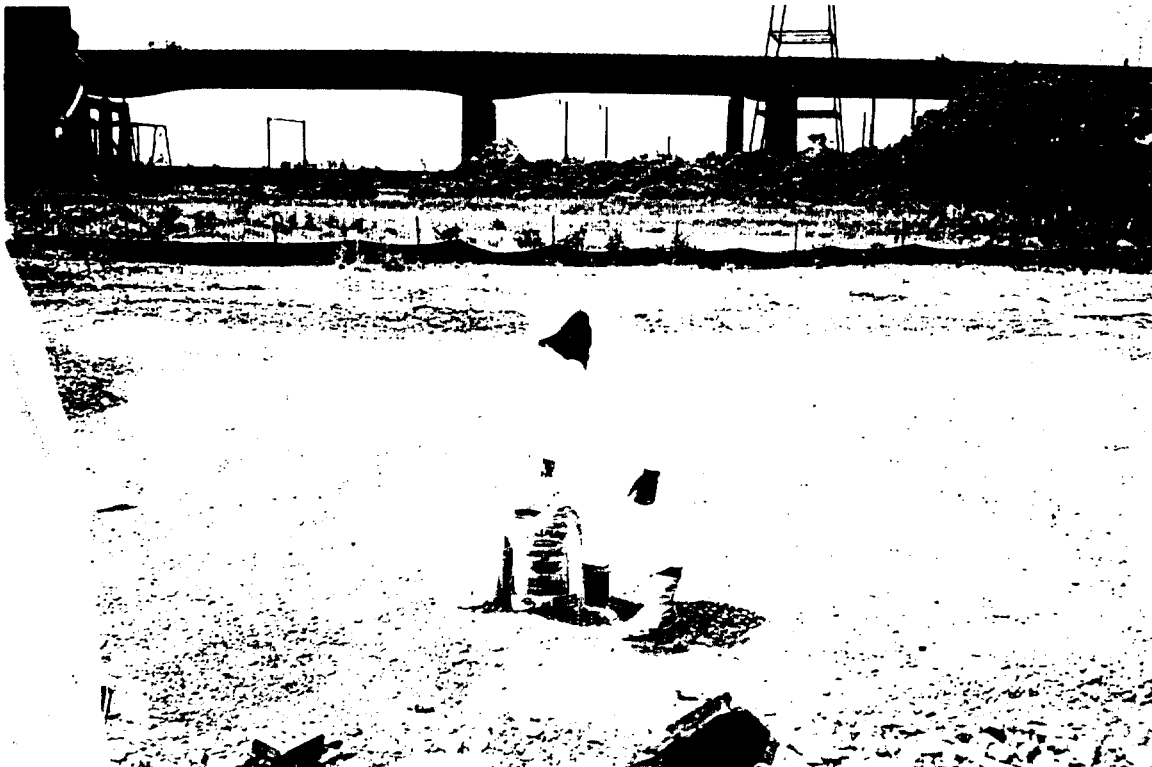
12. INSTALLATION OF DEWATERING SYSTEM IN APSS AREA OF CONCERN.



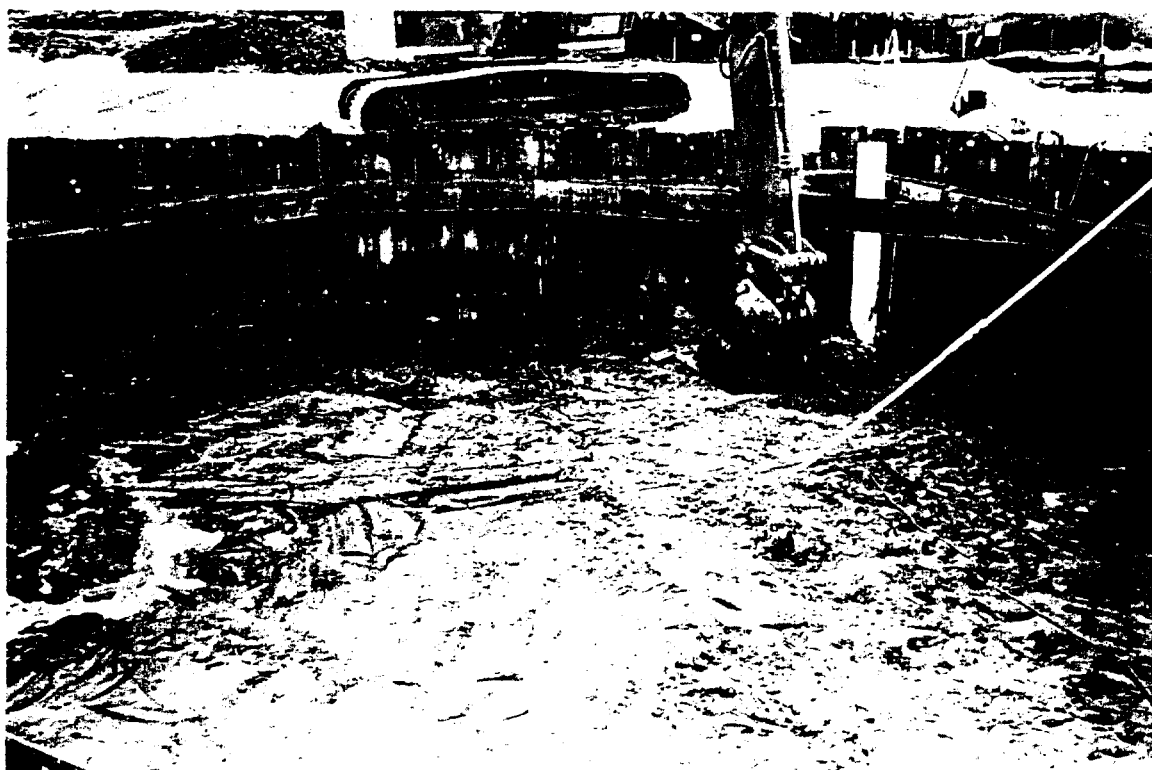
13. EXCAVATION OF SSP AREA OF CONCERN.



14. BACKFILLING OF SSP AREA OF CONCERN WITH CLEAN FILL.



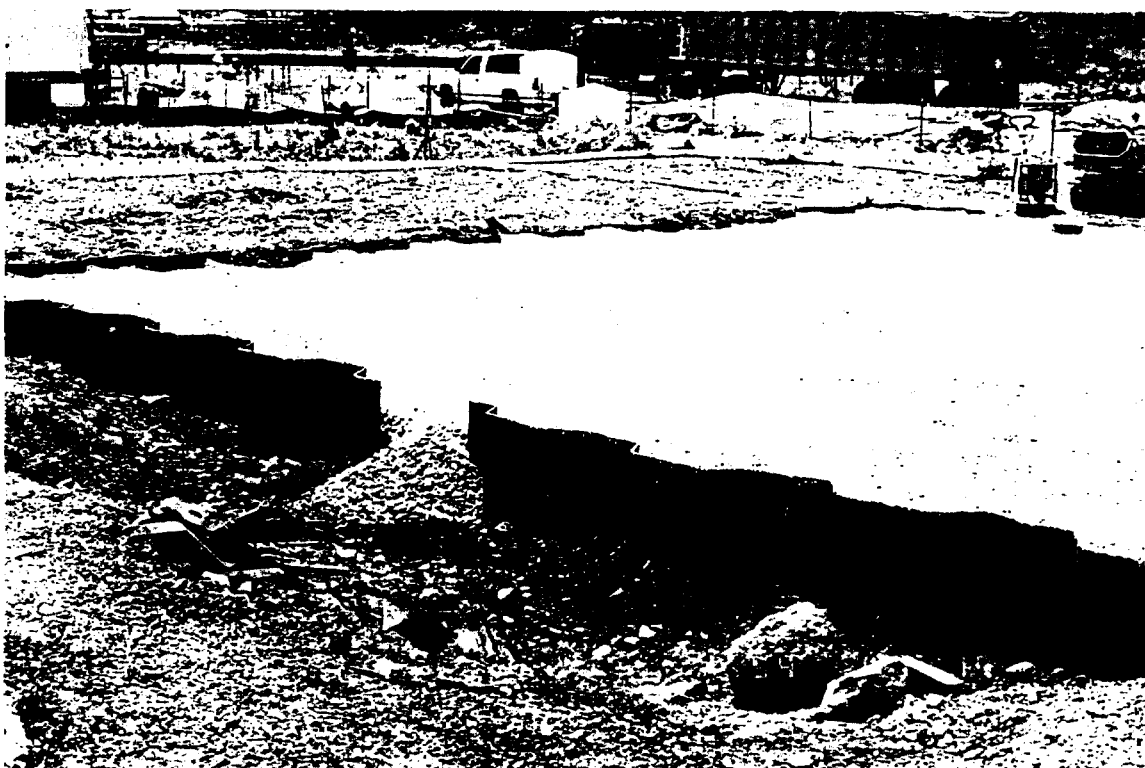
15. SSP AREA OF CONCERN AFTER BACKFILLING AND COMPACTION
OF CLEAN FILL.



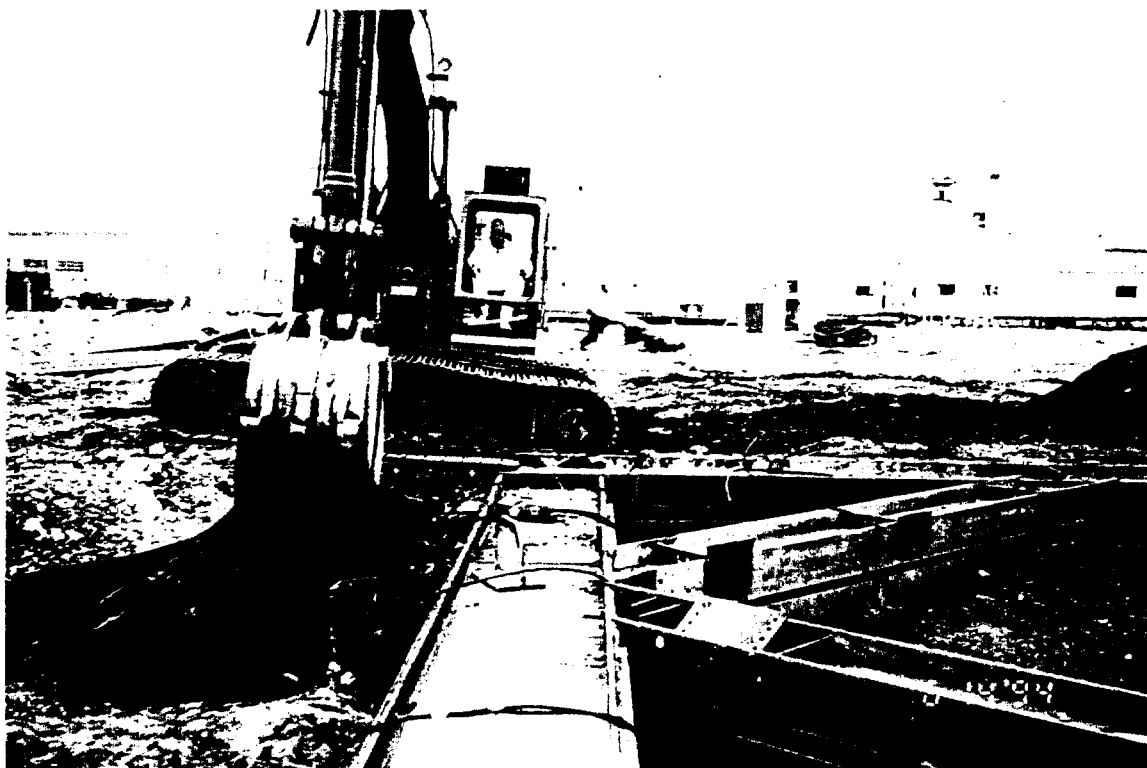
16. EXCAVATION OF APSS AREA OF CONCERN.



17. BACKFILLING OF APSS AREA OF CONCERN WITH CLEAN FILL.



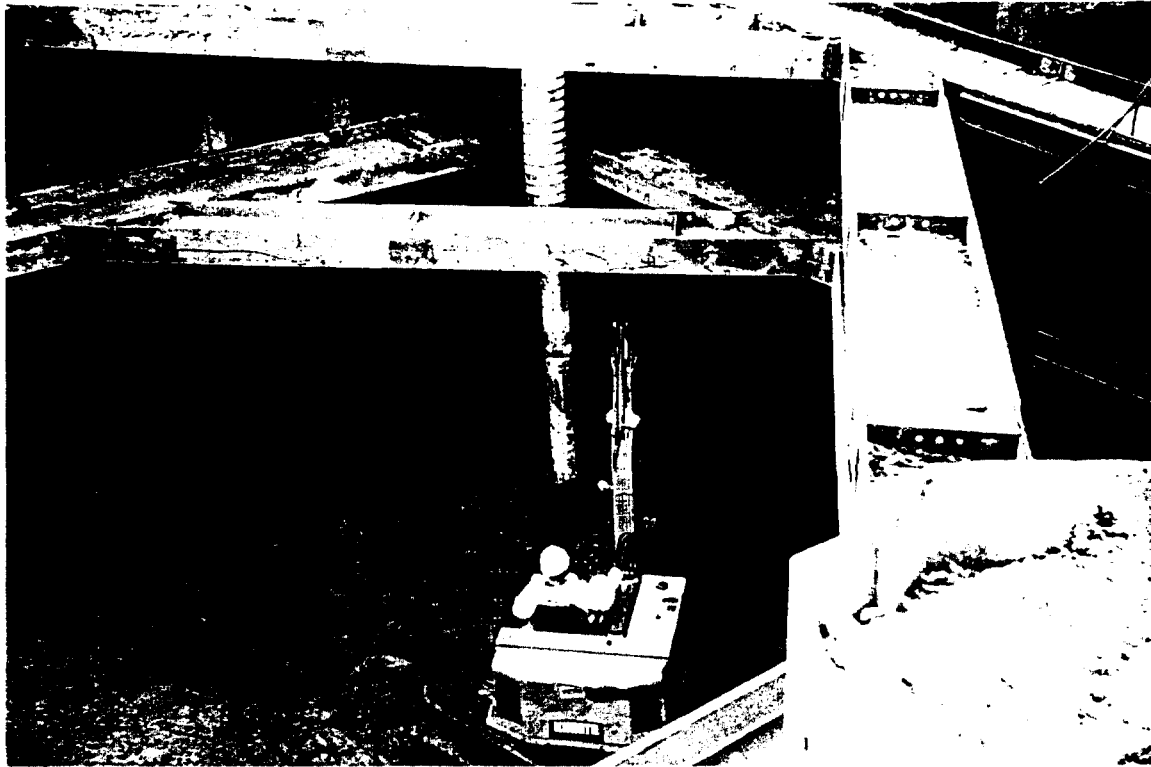
18. APSS AREA OF CONCERN AFTER BACKFILLING AND COMPACTION OF CLEAN FILL.



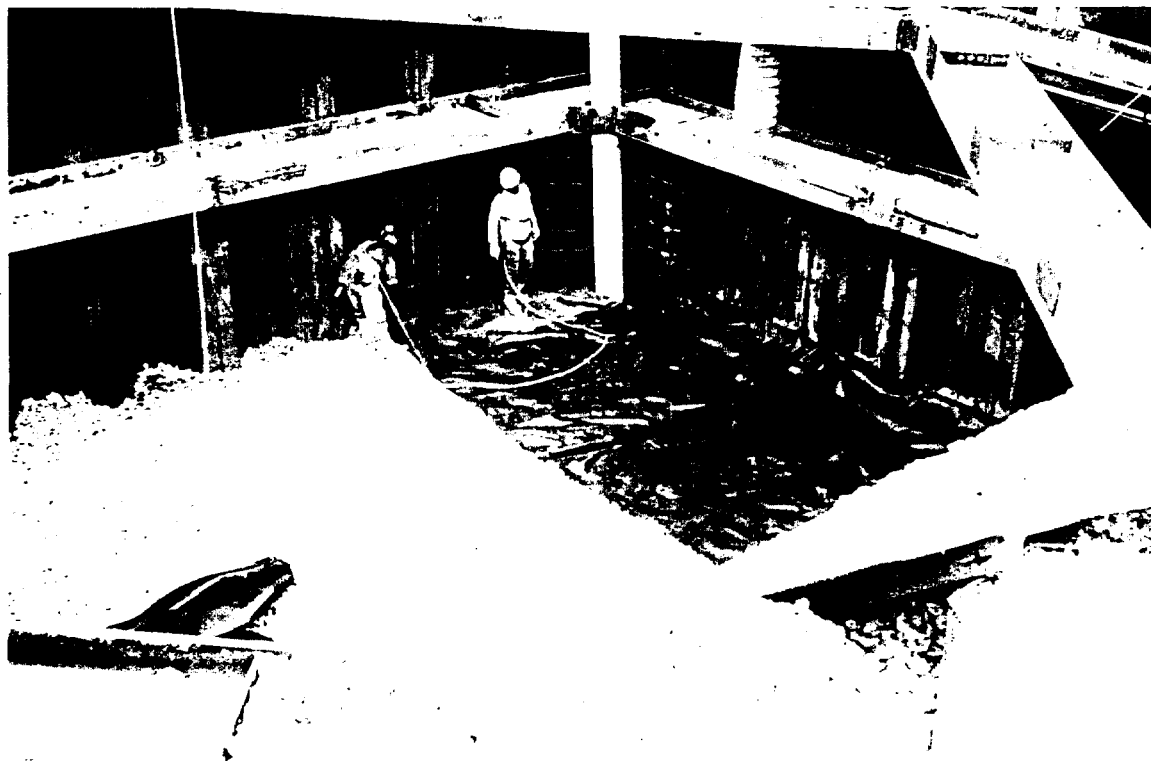
19. EXCAVATION OF OUTER PDA AREA OF CONCERN.



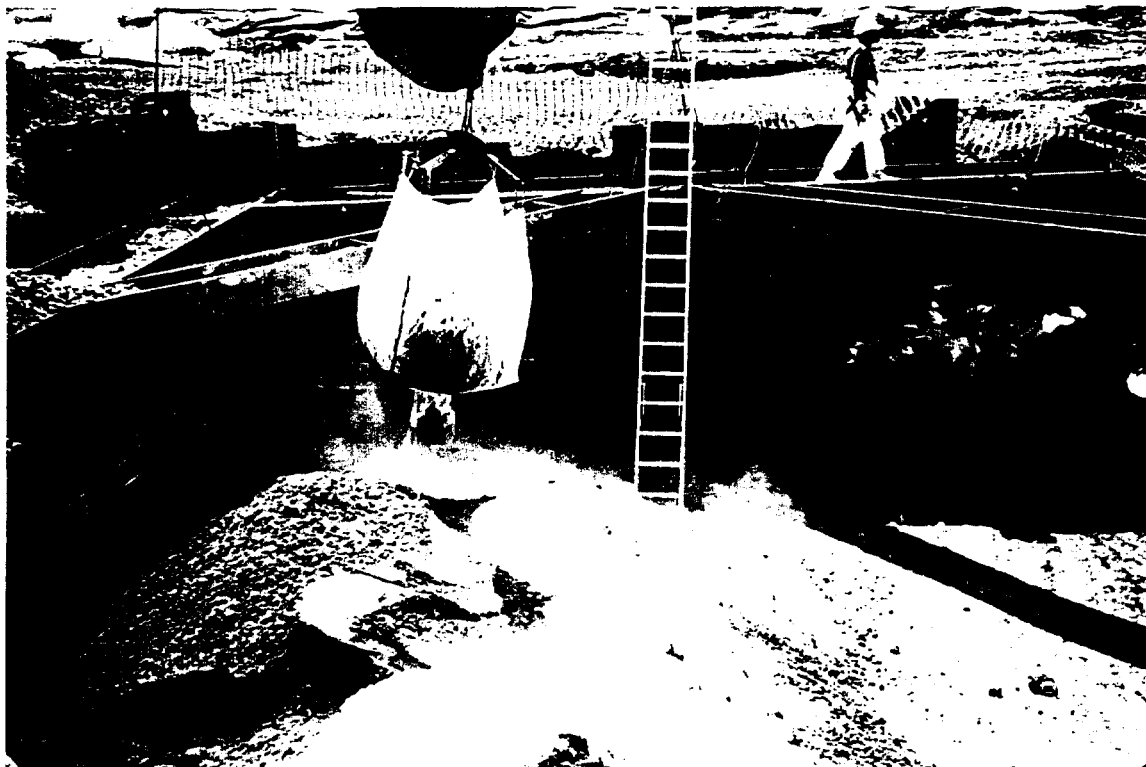
20. BACKFILLING OF OUTER PDA AREA OF CONCERN WITH CLEAN FILL.



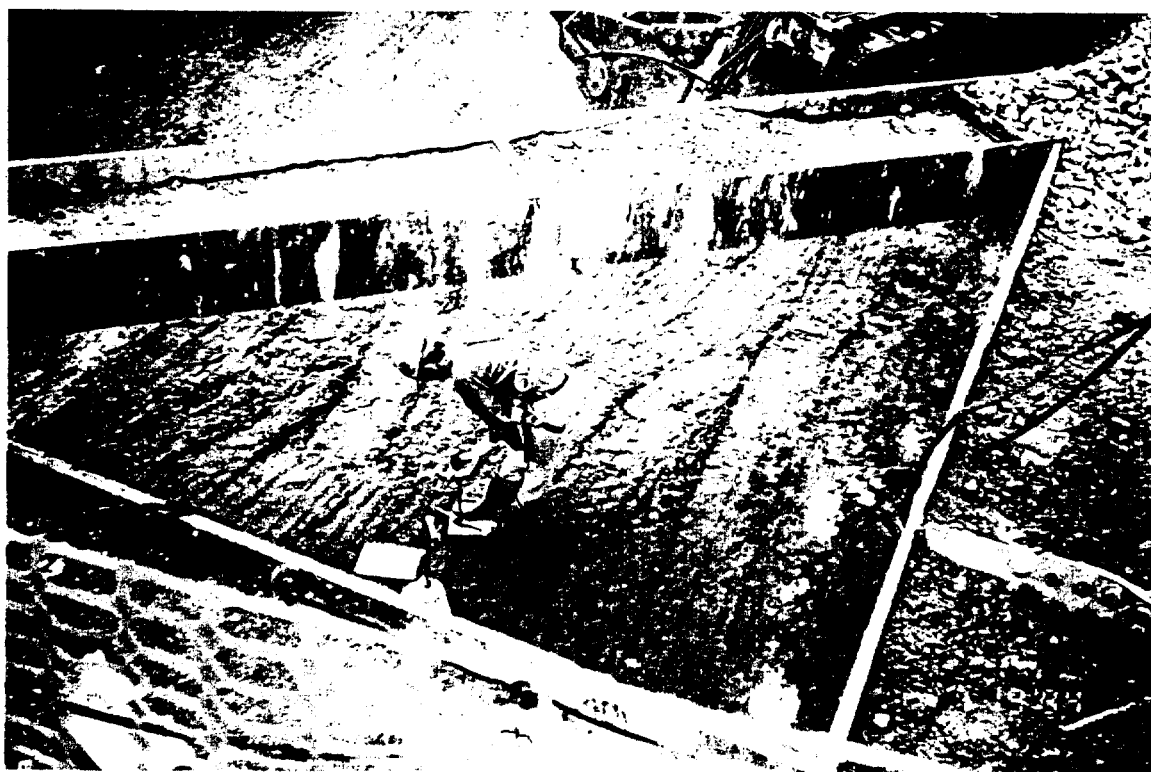
21. EXCAVATION OF INNER PDA AREA OF CONCERN.



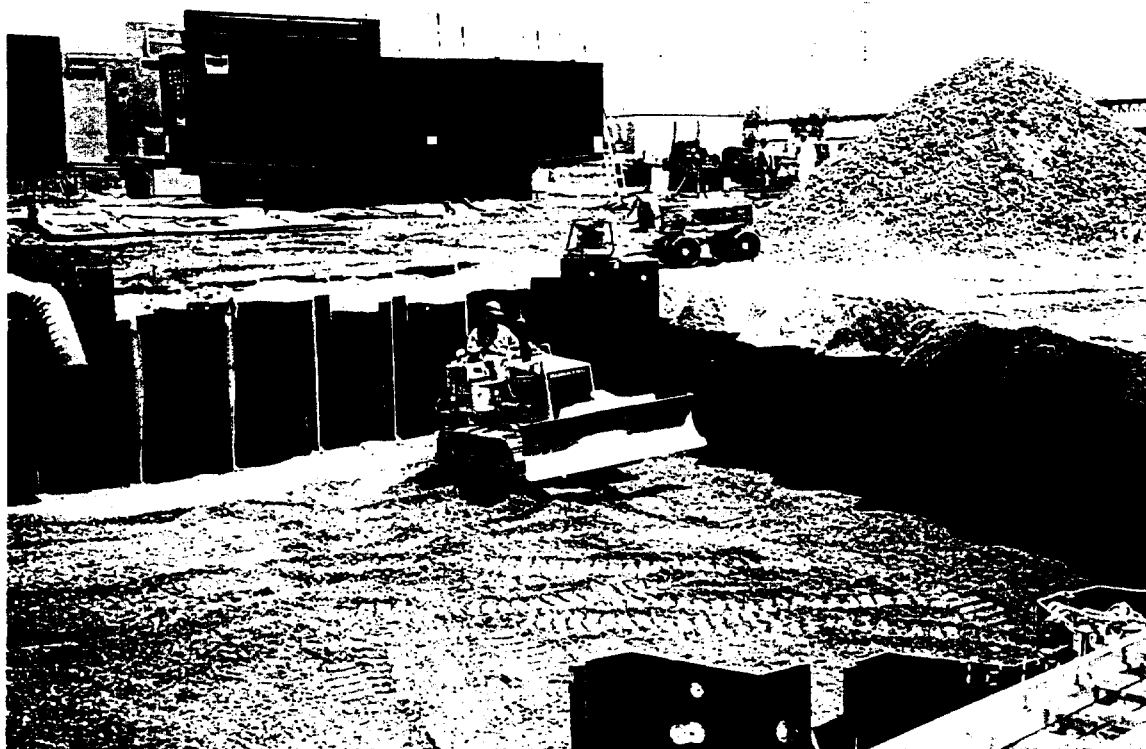
22. PLACEMENT OF GEOTEXTILE OVER NJDOT NO. 2 CRUSHED
STONE BACKFILL AT INNER PDA AREA OF CONCERN.



23. RE-INSTALLATION OF THE PEAT LAYER WITH SOIL/BENTONITE MIX IN THE INNER PDA AREA OF CONCERN.



24. COMPACTION TESTING OF SOIL/BENTONITE LAYER AT INNER PDA AREA OF CONCERN.



25. BACKFILLING OF INNER PDA WITH CLEAN FILL AFTER
BACKFILLING AND COMPACTION OF OUTER PDA.



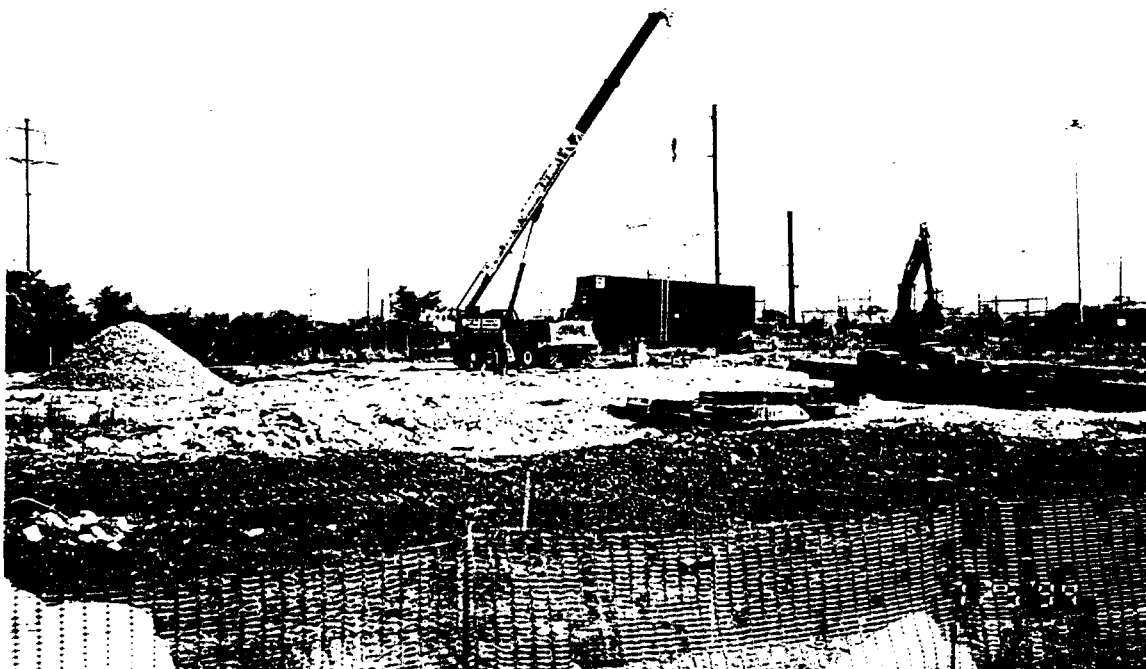
26. LOADOUT OF CONTAMINATED SOIL FROM SOIL HANDLING AREA.



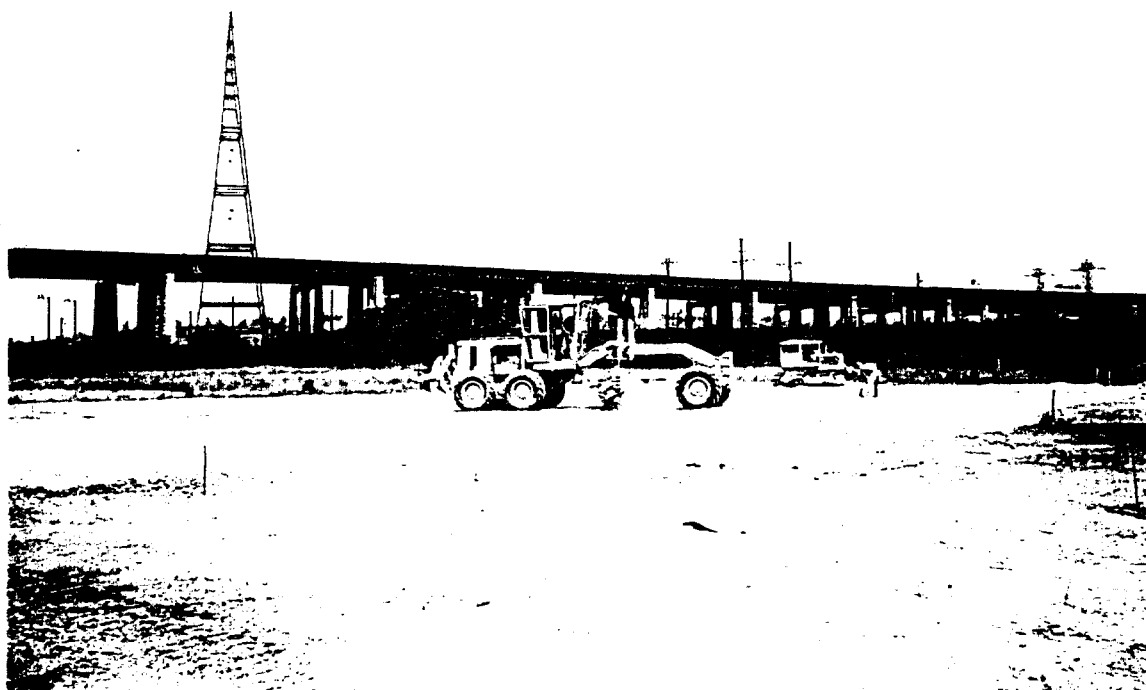
27. DISMANTLING OF SOIL HANDLING AREA.



28. REMOVAL OF GRANULAR ACTIVATED CARBON FROM CARBON
UNITS IN WATER TREATMENT SYSTEM.



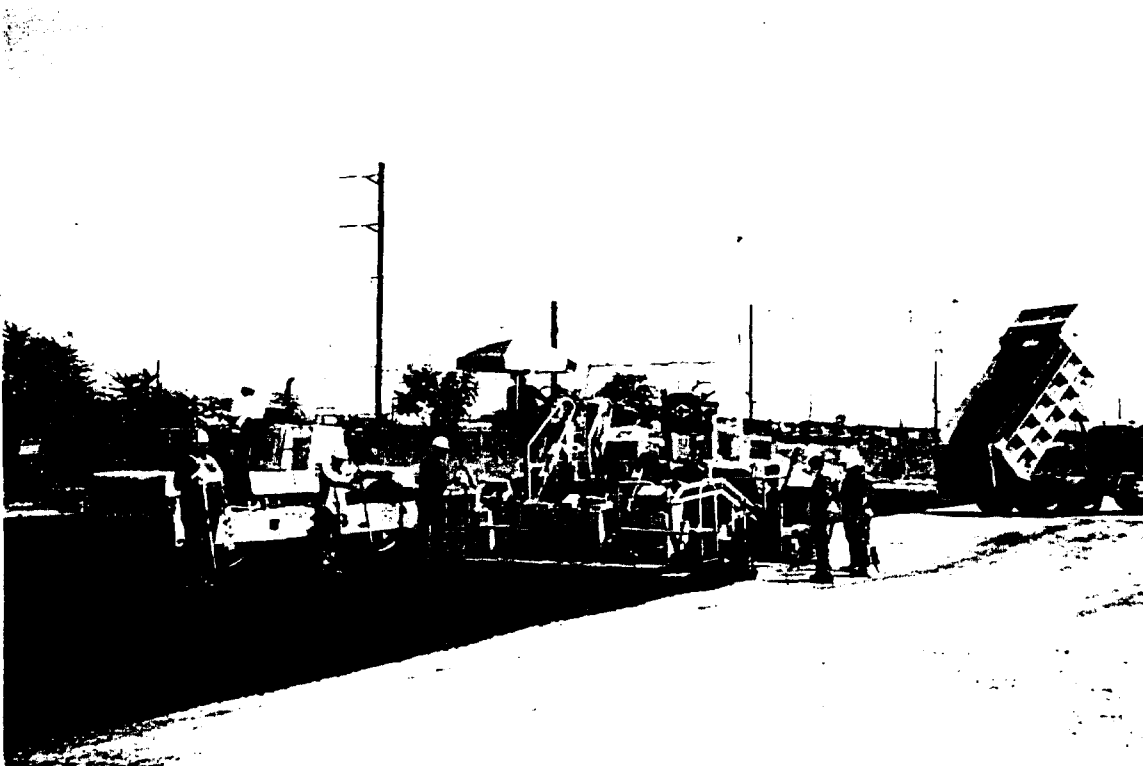
29. DEMOBILIZATION OF WATER TREATMENT SYSTEM.



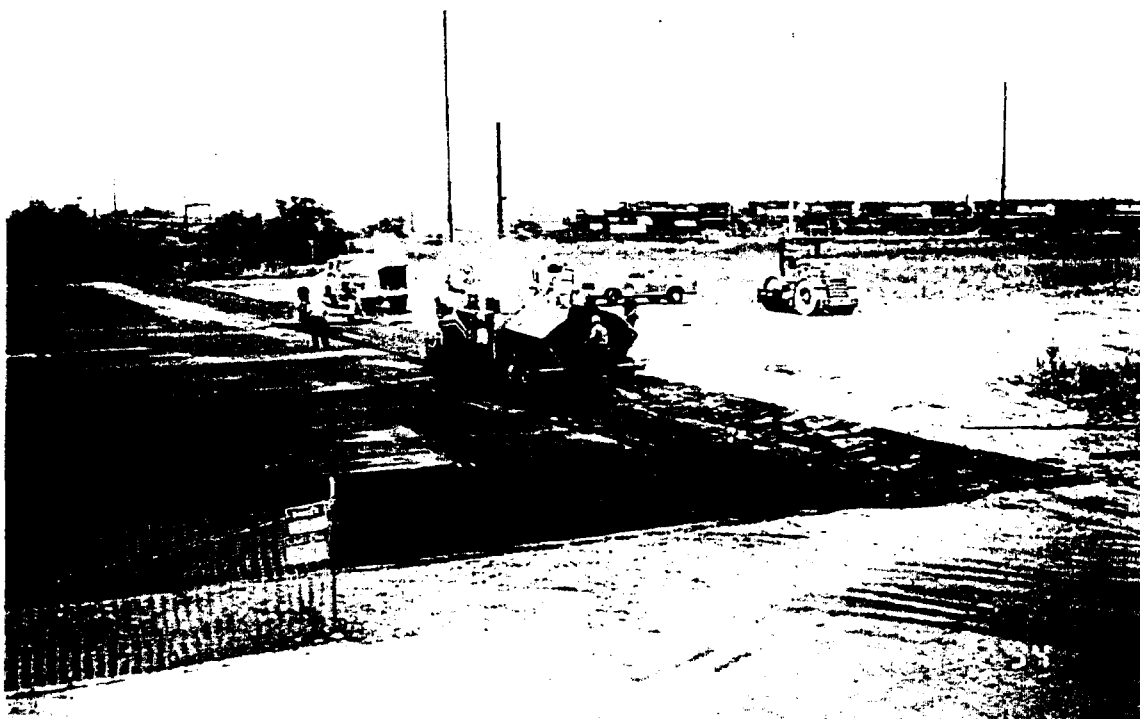
30. PREPARATION OF ASPHALT CAP SUBBASE OVER EXISTING SUBGRADE.



31. GRADING OF 6" STONE SUBBASE.



32. INSTALLATION OF 4" BITUMINOUS BASE COURSE.



33. INSTALLATION OF 2" BITUMINOUS WEARING COURSE.



34. DUMP TRAILER OF MISCELLANEOUS DEBRIS FOR DISPOSAL AT CHEMICAL WASTE MANAGEMENT'S TSCA LANDFILL IN MODEL CITY, NEW YORK.



35. REMOVAL OF INJECTION TRENCH.



36. FINISHED ASPHALT CAP AFTER COMPLETION OF REMEDIAL ACTION ACTIVITIES.

New Jersey Department of Environmental Protection and Energy
Water Technical Programs — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT #

of well sealed

Bureau of Water Allocation

CN 029

Trenton, NJ 08625-0029

DATE WELL SEALED

5/5/92

PROPERTY OWNER

Monsanto Company

ADDRESS

End of Pennsylvania Avenue, Kearny, NJ

WELL LOCATION

Same As Above

Street & No., Township, County

W-3S, WA, Long = 74°07', Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED:

Monitoring Well

REASON FOR ABANDONMENT:

Decommissioning Plan

WAS A NEW WELL DRILLED?

☐ YES☒ NO

PERMIT # OF NEW WELL:

TOTAL DEPTH OF WELL

12'

DIAMETER

4"

CASING LENGTH

2'

SCREEN LENGTH

10'

NUMBER OF CASINGS

1

MATERIAL USED TO SEAL WELL:

Gallons of Water

Lbs. of Cement

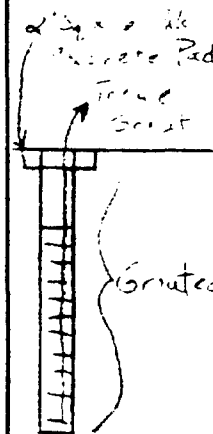
Lbs. of Bentonite

Lbs. of Sand/Gravel

(none if well is contaminated)

FORMATION:

Consolidated

☒ UnconsolidatedCross-section
of sealed wellDraw a sketch showing distance and relations of well site to
nearest roads, buildings, etc.

See Attached



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE?

☒ YES☐ NO

CASING MATERIAL: Sch. 40 PVC

WERE OTHER OBSTRUCTIONS REMOVED?

☒ YES☐ NO

WHAT WERE THE OBSTRUCTIONS: Protective Casing

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work

Address

(Print or Type)

Mailing Date

License #

Signature of Person Doing Sealing Work

WELL ABANDONMENT REPORT

MAIL TO:

Bureau of Water Allocation
CN 029
Trenton, NJ 08625-0029

WELL PERMIT # 26-70043 D
of well sealed

DATE WELL SEALED 5/5/92

— PROPERTY OWNER Consento Company

ADDRESS End of Pennsylvania Avenue, Kearny, NJ

— WELL LOCATION Same As Above

Street & No., Township, County
187-30th St, EA, Long = 74°07' Lat. = 40°44'

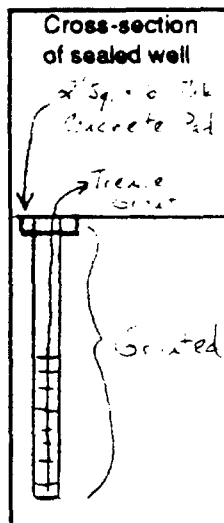
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well

— REASON FOR ABANDONMENT: Decommissioning Plan

WAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: _____

TOTAL DEPTH OF WELL 30'
DIAMETER 1"
— CASING LENGTH 15'
SCREEN LENGTH 15'
NUMBER OF CASINGS 1



Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

— MATERIAL USED TO SEAL WELL:

| | |
|------------|---------------------|
| <u>14</u> | Gallons of Water |
| <u>100</u> | Lbs. of Cement |
| <u>--</u> | Lbs. of Bentonite |
| <u>--</u> | Lbs. of Sand/Gravel |

(none if well is contaminated)

FORMATION: X Consolidated
 Unconsolidated

— To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

— WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

— I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Elis Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
— Print or Type)

Address

[Signature]
Signature of Person Doing Sealing Work

6/15/92
Mailing Date
J-1449

License #

WELL ABANDONMENT REPORT

MAIL TO:

WELL PERMIT # NA
of well sealed

Bureau of Water Allocation
CN 029
Trenton, NJ 08625-0029

DATE WELL SEALED 5/5/92

PROPERTY OWNER Monsanto Company

ADDRESS End of Pennsylvania Avenue, Kearny, NJ

WELL LOCATION Same As Above

Street & No., Township, County

LI-05, NA, Long = 74°07' Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well

REASON FOR ABANDONMENT: Decommissioning Plan

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

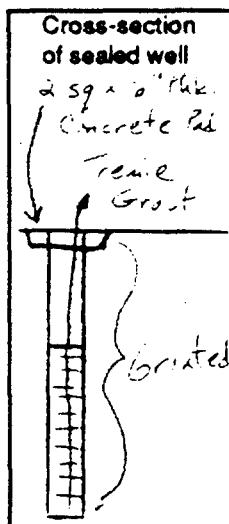
PERMIT # OF NEW WELL: _____

TOTAL DEPTH OF WELL 15'
DIAMETER 1"
CASING LENGTH 5'
SCREEN LENGTH 10'
NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

7 Gallons of Water
00 Lbs. of Cement
-- Lbs. of Bentonite
-- Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated



Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)

A. C. Schultes, Inc.
Address

A. C. Schultes, Inc.
Signature of Person Doing Sealing Work

6/15/92
Mailing Date
J-1449
License #

850131532

WR-020
/ 89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # 26-20145-3
of well sealedBureau of Water Allocation
CN 029
Trenton, NJ 08625DATE WELL SEALED 5/5/92PROPERTY OWNER Monsanto CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As Above

Street & No., Township, County

WV-9D, NA, Long. = 74°07' Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring WellREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES☒ NO

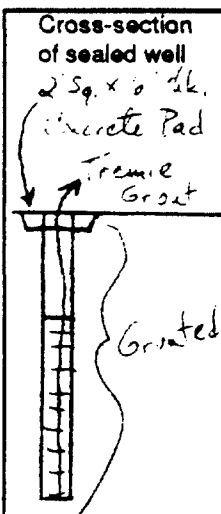
PERMIT # OF NEW WELL: _____

TOTAL DEPTH OF WELL 30'DIAMETER 4"CASING LENGTH 20'SCREEN LENGTH 10'NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

| | |
|------------|---------------------|
| <u>9.5</u> | Gallons of Water |
| <u>130</u> | Lbs. of Cement |
| <u>--</u> | Lbs. of Bentonite |
| <u>--</u> | Lbs. of Sand/Gravel |

(none if well is contaminated)

FORMATION: Consolidated
☒ Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Name of Person Doing Sealing Work
(Print or Type) Eli GonzalezAddress A. C. Schultes, Inc.
Eli Gonzalez / FSP
Signature of Person Doing Sealing WorkMailing Date 6/15/92
J-1449
License #

850131533

D-020
8 99New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # NA
of well sealed
5/5/92Bureau of Water Allocation
CN 029
Trenton, NJ 08625

DATE WELL SEALED _____

PROPERTY OWNER Monsanto CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As above

Street & No., Township, County

MW-11S, NA, Long. = 74°07' Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

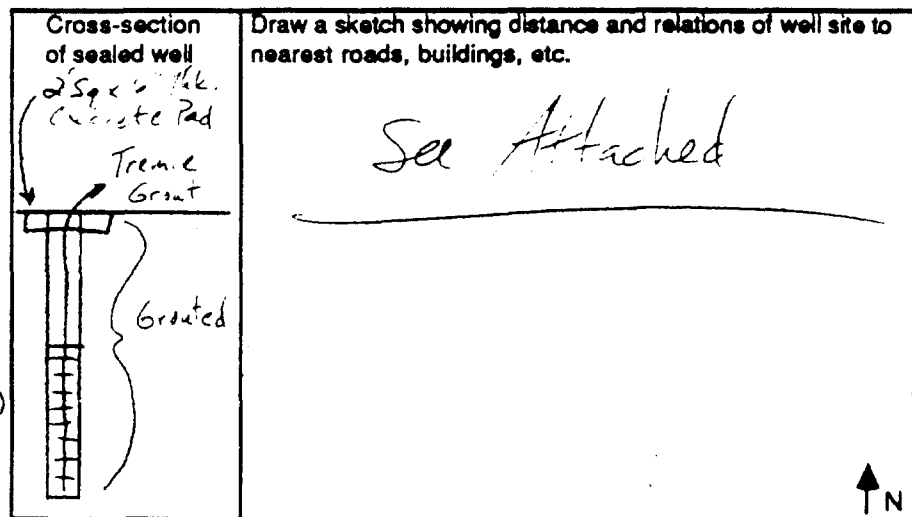
TYPE OF WELL ABANDONED: Monitoring WellREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

| | |
|---------------------|------------|
| TOTAL DEPTH OF WELL | <u>14'</u> |
| DIAMETER | <u>4"</u> |
| CASING LENGTH | <u>4'</u> |
| SCREEN LENGTH | <u>10'</u> |
| NUMBER OF CASINGS | <u>1</u> |

MATERIAL USED TO SEAL WELL:

| | |
|--------------------------------|---------------------|
| <u>7</u> | Gallons of Water |
| <u>34</u> | Lbs. of Cement |
| <u>--</u> | Lbs. of Bentonite |
| <u>--</u> | Lbs. of Sand/Gravel |
| (none if well is contaminated) | |

FORMATION: Consolidated
☒ Unconsolidated

o permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS? Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
(Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date

J-1449

License #

COPIES: White - Water Allocation

Yellow - Owner

Pink - Health Dept.

Goldenrod - Driller

850131534

TR-020
/ 89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

Bureau of Water Allocation
CN 029
Trenton, NJ 08625WELL PERMIT # 26-20147-0
of well sealed
5/4/92
DATE WELL SEALEDPROPERTY OWNER Monsanto CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As Above

Street & No., Township, County

MW-11D, NA, Long = 74°07' Lat. = 40°44'

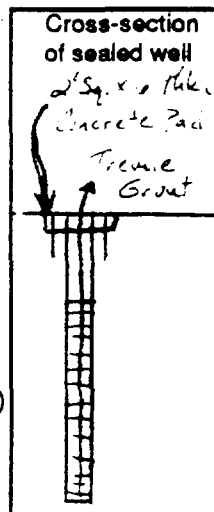
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

Monitoring Well

TYPE OF WELL ABANDONED:

REASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL:TOTAL DEPTH OF WELL 30'
DIAMETER 4"
CASING LENGTH 20'
SCREEN LENGTH 10'
NUMBER OF CASINGS 2

MATERIAL USED TO SEAL WELL:

2.5 Gallons of Water
130 Lbs. of Cement
-- Lbs. of Bentonite
-- Lbs. of Sand/Gravel
(none if well is contaminated)FORMATION: Consolidated
☒ Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
(Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date

J-1449

License #

850131535

R-020
89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # 26-7042-12

of well sealed

Bureau of Water Allocation

DATE WELL SEALED 5/4/92

CN 029

Trenton, NJ 08625

PROPERTY OWNER Monsanto Company

ADDRESS End of Pennsylvania Avenue, Kearny, NJ

WELL LOCATION Same As Above

Street & No., Township, County 071

NW-12S, NA, Long = 74° ~~00'~~ Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well

REASON FOR ABANDONMENT: Decommissioning Plan

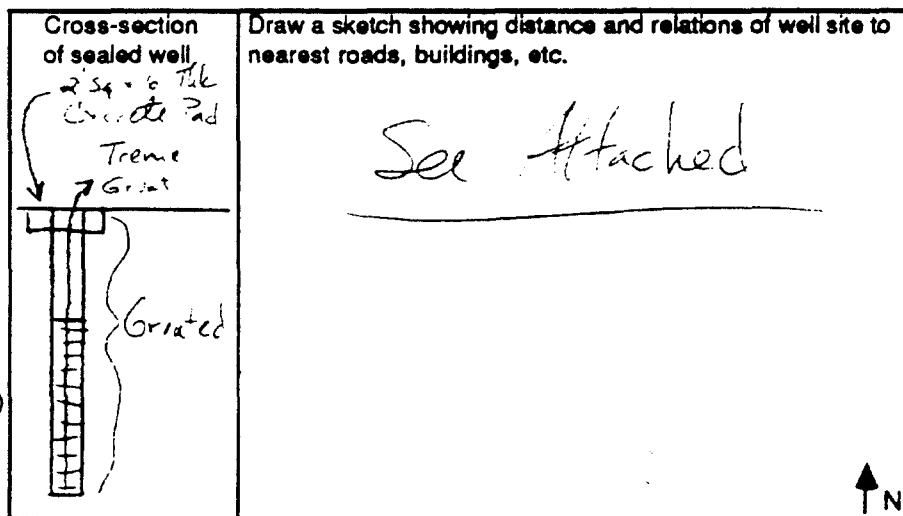
WAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

| | |
|---------------------|-----|
| TOTAL DEPTH OF WELL | 15' |
| DIAMETER | 4" |
| CASING LENGTH | 5' |
| SCREEN LENGTH | 10' |
| NUMBER OF CASINGS | 1 |

MATERIAL USED TO SEAL WELL:

| | |
|--------------------------------|---------------------|
| 7 | Gallons of Water |
| 100 | Lbs. of Cement |
| -- | Lbs. of Bentonite |
| -- | Lbs. of Sand/Gravel |
| (none if well is contaminated) | |

FORMATION: ☐ Consolidated
☒ Unconsolidated

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective ~~CX~~ Casings

certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date
J1449

License #

COPIES: White - Water Allocation

Yellow - Owner

Pink - Health Dept.

Goldenrod - Driller

850131536

R-020
/ 89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # 26-20148-8
of well sealed

Bureau of Water Allocation

CN 029

Trenton, NJ 08625

DATE WELL SEALED 5/4/92

PROPERTY OWNER Monsanto Company

ADDRESS End of Pennsylvania Avenue, Kearny, NJ

WELL LOCATION Same As Above

Street & No., Township, County

W-12D, NA, Long. = 74°07' Lat. = 40°XX 44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well

REASON FOR ABANDONMENT: Decommissioning Plan

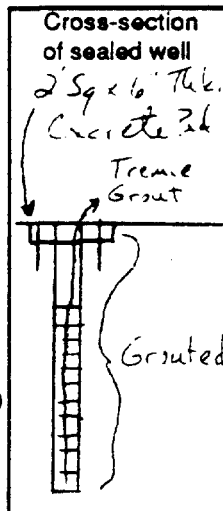
WAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

| | |
|---------------------|-----|
| TOTAL DEPTH OF WELL | 29' |
| DIAMETER | 4" |
| CASING LENGTH | 19' |
| SCREEN LENGTH | 10' |
| NUMBER OF CASINGS | 2 |

MATERIAL USED TO SEAL WELL:

| | |
|--------------------------------|---------------------|
| 13.5 | Gallons of Water |
| 195 | Lbs. of Cement |
| -- | Lbs. of Bentonite |
| -- | Lbs. of Sand/Gravel |
| (none if well is contaminated) | |

FORMATION: ☐ Consolidated
☒ Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
(Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date

J-1449

License #

COPIES: White - Water Allocation

Yellow - Owner

Pink - Health Dept.

Goldenrod - Driller

WELL ABANDONMENT REPORT

MAIL TO:

WELL PERMIT # 26-20139-9

of well sealed

Bureau of Water Allocation

DATE WELL SEALED 5/5/92

CN 029

Trenton, NJ 08625

PROPERTY OWNER Monsanto Company

ADDRESS End of Pennsylvania Avenue, Kearny, NJ

WELL LOCATION Same As Above

Street & No., Township, County

1W-18 15S, NA, Long. = 74°07' lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well

REASON FOR ABANDONMENT: Decommissioning Plan

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

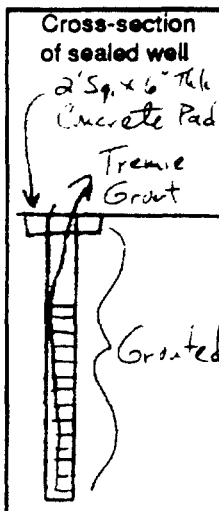
PERMIT # OF NEW WELL:

TOTAL DEPTH OF WELL 15'
DIAMETER 4"
CASING LENGTH 5'
SCREEN LENGTH 10'
NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

7 Gallons of Water
100 Lbs. of Cement
-- Lbs. of Bentonite
-- Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: Consolidated
☒ Unconsolidated



Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date
J-1449

License #

850131538

E 1-020
8 89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # NA
of well sealedBureau of Water Allocation
CN 029
Trenton, NJ 08625DATE WELL SEALED 5/5/92PROPERTY OWNER Monsanto CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As Above

Street & No., Township, County

OB-8, NA, Long. = 74°07', Lat. = 40°44'

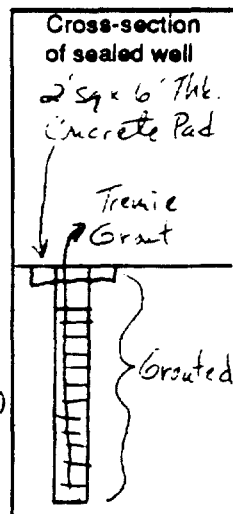
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well PiezometerREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

TOTAL DEPTH OF WELL 6'
DIAMETER 2"
CASING LENGTH -
SCREEN LENGTH 5'
NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

5 Gallons of Water
70 Lbs. of Cement
-- Lbs. of Bentonite
-- Lbs. of Sand/Gravel
(none if well is contaminated)FORMATION: Consolidated
x Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

Name of Person Doing Sealing Work
(Print or Type)

A. C. Schultes, Inc.

Address

Signature of Person Doing Sealing Work

Mailing Date
J-1449

License #

COPIES: White - Water Allocation

Yellow - Owner

Pink - Health Dept.

Goldenrod - Driller

850131539

R-020
8/89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # NA
of well sealedBureau of Water Allocation
CN 029
Trenton, NJ 08625DATE WELL SEALED 5/5/92PROPERTY OWNER Monstato CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As ~~XXXX~~ Above

Street & No., Township, County

OB-11, NA, Long. 74°07', Lat. 40°44'

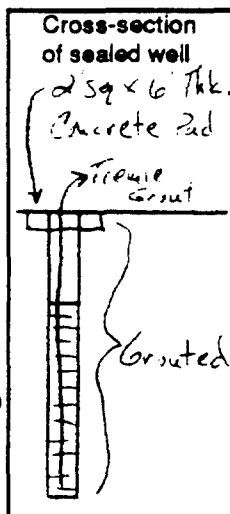
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude).

TYPE OF WELL ABANDONED: ~~Monitoring Well~~ PiezometerREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

TOTAL DEPTH OF WELL 6'
DIAMETER 2"
CASING LENGTH -
SCREEN LENGTH 6'
NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

5 Gallons of Water
70 Lbs. of Cement
-- Lbs. of Bentonite
-- Lbs. of Sand/Gravel
(none if well is contaminated)FORMATION: Consolidated
XX Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)A. C. Schultes, Inc.
AddressEli Gonzalez/TSP
Signature of Person Doing Sealing Work6/15/92
Mailing Date
J-1449

License #

850131540

DWR-020
8/89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

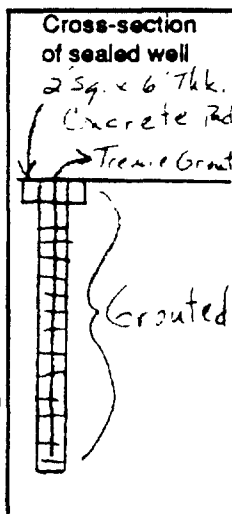
MAIL TO:

WELL PERMIT # NA
of well sealedBureau of Water Allocation
CN 029
Trenton, NJ 08625DATE WELL SEALED 5/5/92PROPERTY OWNER Monsanto CompanyADDRESS Endoof Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As AboveStreet & No., Township, County
OB-12, NA, Long. = 74°07' Lat = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well PiezometerREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: _____TOTAL DEPTH OF WELL 6'
DIAMETER 2"
CASING LENGTH -
SCREEN LENGTH 6'
NUMBER OF CASINGS 1

MATERIAL USED TO SEAL WELL:

5 Gallons of Water
70 Lbs. of Cement
- Lbs. of Bentonite
- Lbs. of Sand/Gravel
(none if well is contaminated)FORMATION: Consolidated
☒ Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)A. C. Schultes, Inc.

Address

E. Gonzalez/TSP
Signature of Person Doing Sealing Work6/15/92
Mailing Date
J-1449

License #

850131541

NR-020
/ 89New Jersey Department of Environmental Protection
Division of Water Resources — Bureau of Water Allocation**WELL ABANDONMENT REPORT**

MAIL TO:

WELL PERMIT # NA
of well sealedBureau of Water Allocation
CN 029
Trenton, NJ 08625DATE WELL SEALED 5/5/92PROPERTY OWNER Monsanto CompanyADDRESS End of Pennsylvania Avenue, Kearny, NJWELL LOCATION Same As Above

Street & No., Township, County

OB-E, NA, Long = 74°07', Lat. = 40°44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring Well PiezometerREASON FOR ABANDONMENT: Decommissioning PlanWAS A NEW WELL DRILLED? ☐ YES☒ NO

PERMIT # OF NEW WELL: _____

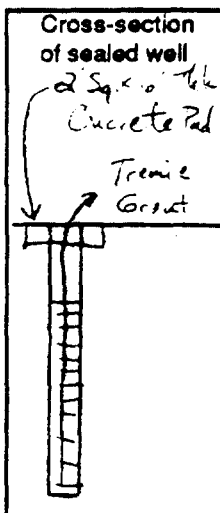
| | |
|---------------------|-----------|
| TOTAL DEPTH OF WELL | <u>6'</u> |
| DIAMETER | <u>2"</u> |
| CASING LENGTH | <u>-</u> |
| SCREEN LENGTH | <u>5'</u> |
| NUMBER OF CASINGS | <u>1</u> |

MATERIAL USED TO SEAL WELL:

| | |
|-----------|---------------------|
| <u>5</u> | Gallons of Water |
| <u>70</u> | Lbs. of Cement |
| <u>--</u> | Lbs. of Bentonite |
| <u>--</u> | Lbs. of Sand/Gravel |

(none if well is contaminated)

FORMATION:

Consolidated
☒ Unconsolidated

Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.

See Attached

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: Sch. 40 PVCWERE OTHER OBSTRUCTIONS REMOVED? ☒ YES ☐ NO WHAT WERE THE OBSTRUCTIONS: Protective Casings

certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez

A. C. Schultes, Inc.

Name of Person Doing Sealing Work
(Print or Type)

Address

Signature of Person Doing Sealing Work

Mailing Date

J-1449

License #

COPIES: White - Water Allocation

Yellow - Owner

Pink - Health Dept.

Goldenrod - Driller

WELL ABANDONMENT REPORT**MAIL TO:**Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426WELL PERMIT # 26-627E
of well sealedDATE WELL SEALED 4-4-94

PROPERTY OWNER Monsanto Company

ADDRESS Pennsylvania Ave. EAHRY N.J.

WELL LOCATION Pennsylvania Ave EAHRY Hudson County
Street & No., Township, County
110-1 10-74-06' 11-40-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring

REASON FOR ABANDONMENT: Not Needed

WAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: 1114

TOTAL DEPTH OF WELL 11'

DIAMETER 4"

CASING LENGTH 1'

SCREEN LENGTH 10'

NUMBER OF CASINGS one

MATERIAL USED TO SEAL WELL:

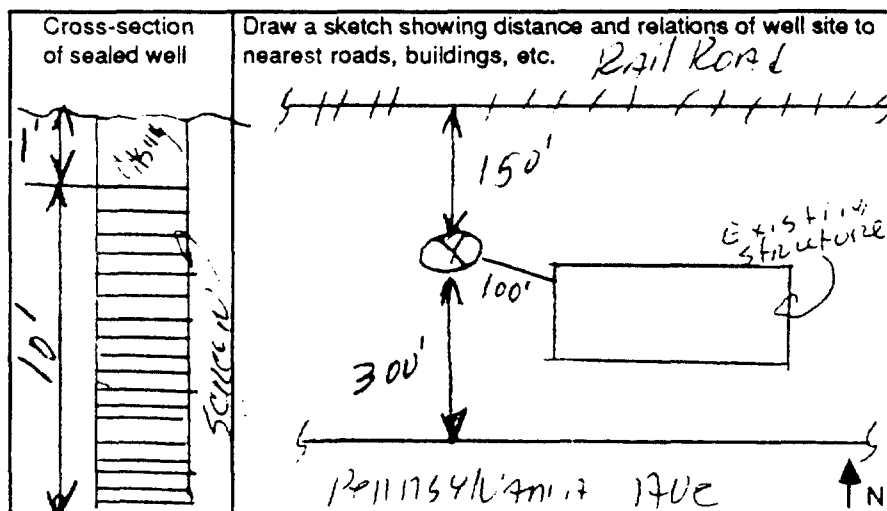
7 Gallons of Water

100 Lbs. of Cement

Lbs. of Bentonite

Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated



To permit adequate **grouting**, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. **Pressure** grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☒ NO CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

El Guzman
Name of Person Doing Sealing Work
(Print or Type)

A C Schultes, Inc
Address
El Guzman
Signature of Person Doing Sealing Work

4/18/94
Mailing Date
J1449
License #

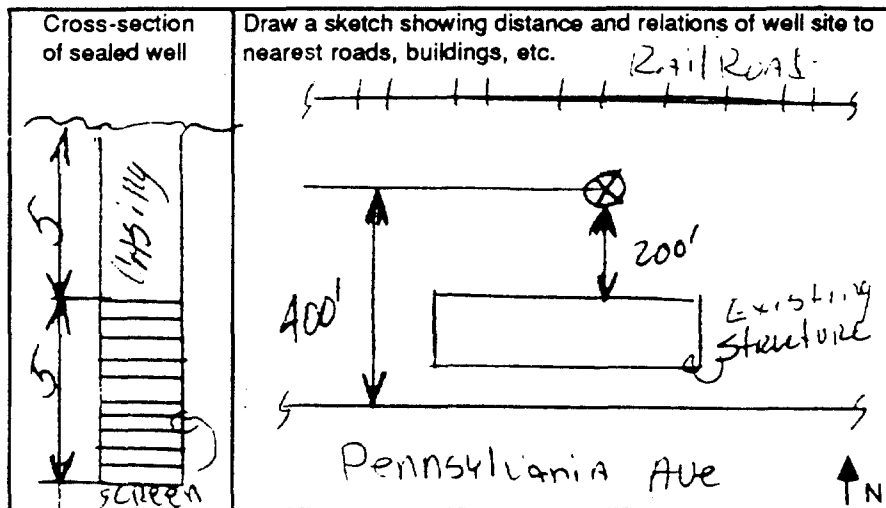
WELL ABANDONMENT REPORTMAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # 266281
of well sealedDATE WELL SEALED 4-9-94

PROPERTY OWNER Monsanto Company
ADDRESS Pennsylvania Ave Kearny N.J.
WELL LOCATION Pennsylvania Ave Kearny Hudson County
Street & No., Township, County
110-45 West 74°-06' North 40°-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)
TYPE OF WELL ABANDONED: Monitoring
REASON FOR ABANDONMENT: Not Sealed
WAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: 11A

TOTAL DEPTH OF WELL 10'
DIAMETER 2 1/2"
CASING LENGTH 5'
SCREEN LENGTH 5'
NUMBER OF CASINGS one
MATERIAL USED TO SEAL WELL:
7 Gallons of Water
100 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVC
WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez A.C. Schutte, Inc. 4/18/94
Name of Person Doing Sealing Work Address Mailing Date
(Print or Type)
Eli Gonzalez
Signature of Person Doing Sealing Work License # J-1449

WELL ABANDONMENT REPORT

MAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # 266280
of well sealed

DATE WELL SEALED 4-4-94

PROPERTY OWNER Monsanto Company

ADDRESS Pennsylvania Ave Kearny N.J.

WELL LOCATION Pennsylvania Ave Kearny N.J. Hudson County
Street & No., Township, County

11W-55 West 74°-06' North 40°-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring

REASON FOR ABANDONMENT: Not Needed

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

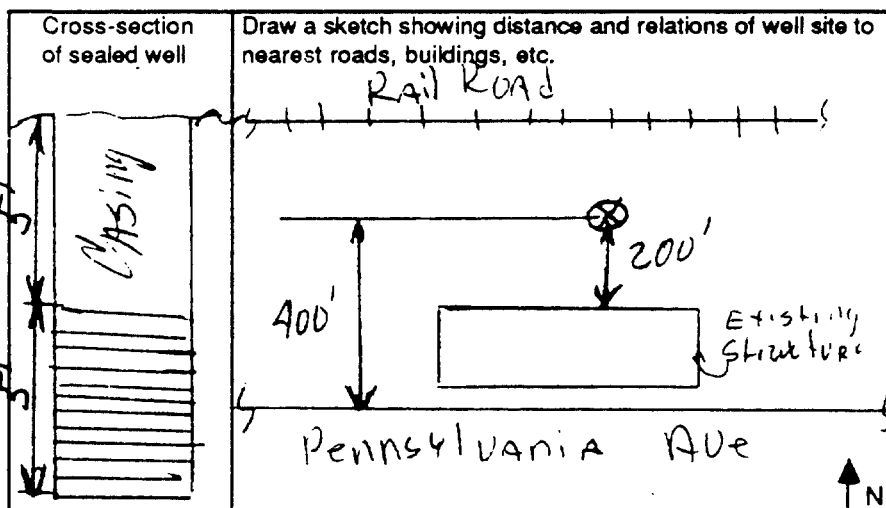
PERMIT # OF NEW WELL: N/A

TOTAL DEPTH OF WELL 10'
DIAMETER 4"
CASING LENGTH 5'
SCREEN LENGTH 5'
NUMBER OF CASINGS five

MATERIAL USED TO SEAL WELL:

7 Gallons of Water
100 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)

A.C. Schultes, Inc.
Address

Eli Gonzalez, Inc.
Signature of Person Doing Sealing Work

4/18/94
Mailing Date

J. 1449
License #

WELL ABANDONMENT REPORT

MAIL TO:

WELL PERMIT # 26-60142-9
of well sealed

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

DATE WELL SEALED 4-4-94

PROPERTY OWNER Monsanto Company

ADDRESS Pennsylvania Ave Trenton N.J.

WELL LOCATION Pennsylvania Ave Trenton N.J. Hudson County

Street & No., Township, County
MW-6D 1221 74°-06' North 40°-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring

REASON FOR ABANDONMENT: Not Needed

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

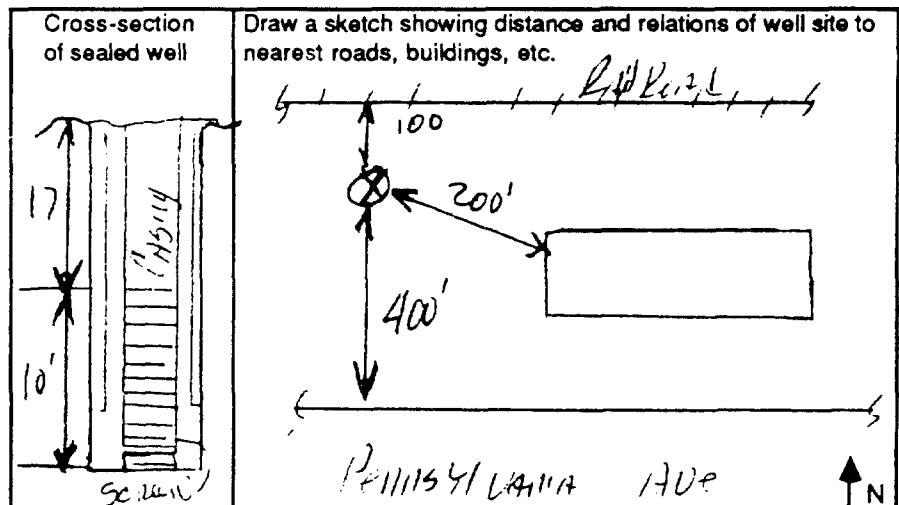
PERMIT # OF NEW WELL: -1A-

TOTAL DEPTH OF WELL 27'
DIAMETER 4"
CASING LENGTH 17'
SCREEN LENGTH 10'
NUMBER OF CASINGS 4

MATERIAL USED TO SEAL WELL:

21 Gallons of Water
300 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVC / Steel

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

El. Gonzalez
Name of Person Doing Sealing Work
(Print or Type)

A.C. Schrecks, Inc
Address

El. Gonzalez
Signature of Person Doing Sealing Work

4/18/94
Mailing Date
5-1449
License #

WELL ABANDONMENT REPORT

MAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # 266279
of well sealed

DATE WELL SEALED 9-4-94

PROPERTY OWNER Monsanto Company

ADDRESS Pennsylvania Ave Kearny N.J.

WELL LOCATION Pennsylvania Ave. Kearny Hudson County
Street & No., Township, County

NW-65 West 74°-66' North 40°-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: monitoring

REASON FOR ABANDONMENT: Not Needed

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

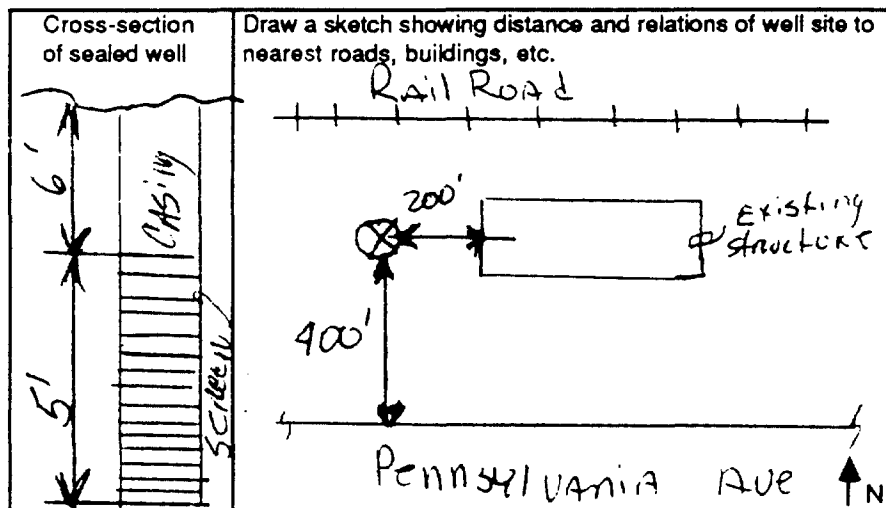
PERMIT # OF NEW WELL: -NA-

TOTAL DEPTH OF WELL 11
DIAMETER 4"
CASING LENGTH 11-6'
SCREEN LENGTH 5'
NUMBER OF CASINGS one

MATERIAL USED TO SEAL WELL:

7 Gallons of Water
100 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☒ Consolidated
☐ Unconsolidated



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVC

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

El. Gonzalez
Name of Person Doing Sealing Work
Print or Type)

Address

A.C. Schutte, Inc
El. Gonzalez / ps
Signature of Person Doing Sealing Work

Mailing Date

License #

4/18/94
51449

WELL ABANDONMENT REPORT

MAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # 26-20143-7

DATE WELL SEALED 4-9-94
of well sealed

PROPERTY OWNER Monsanto Company

ADDRESS Pennsylvania Ave. Kearny N.J.

WELL LOCATION Pennsylvania Ave Kearny N.J. Hudson County

Street & No., Township, County

W-70 West 74°-06' North 40°-44'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: monitoring West 74°-06' North 40°-44'

REASON FOR ABANDONMENT: Not Needed

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

PERMIT # OF NEW WELL: —

TOTAL DEPTH OF WELL 27'

DIAMETER 4"

CASING LENGTH 17'

SCREEN LENGTH 10'

NUMBER OF CASINGS 2

MATERIAL USED TO SEAL WELL:

21

Gallons of Water

300

Lbs. of Cement

Lbs. of Bentonite

Lbs. of Sand/Gravel

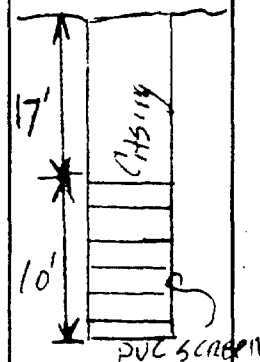
(none if well is contaminated)

FORMATION:

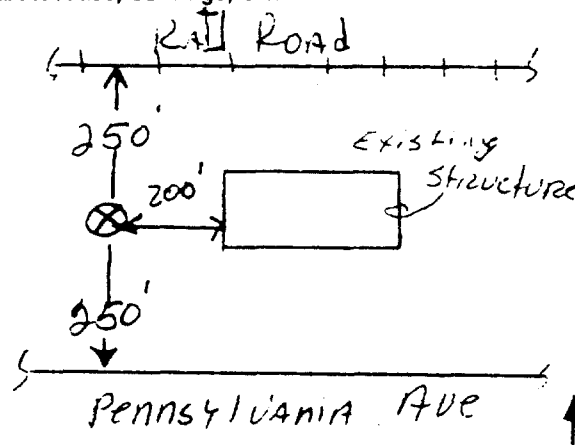
Consolidated

☒ Unconsolidated

Cross-section
of sealed well



Draw a sketch showing distance and relations of well site to
nearest roads, buildings, etc.



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES

☐ NO

CASING MATERIAL: P.V.C. / steel

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES

☒ NO

WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

El. Gonzalez

Name of Person Doing Sealing Work

Print or Type)

Address

A.C. Schultes, Inc

Signature of Person Doing Sealing Work

4/18/94

Mailing Date

51449

License #

WELL ABANDONMENT REPORTMAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # _____
of well sealed

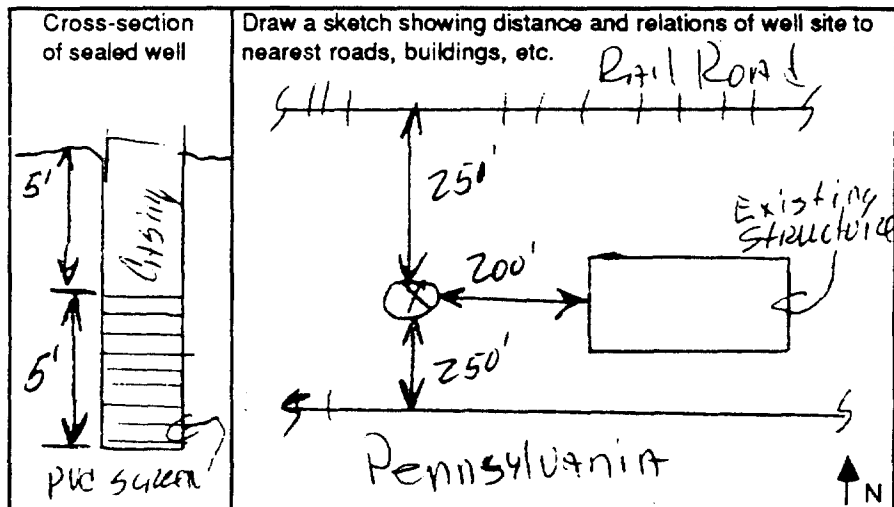
DATE WELL SEALED _____

PROPERTY OWNER Monsanto Company
ADDRESS Pennsylvania Ave. Kearny N.J.
WELL LOCATION Pennsylvania Ave. Kearny N.J. Hudson County
Street & No., Township, County
1110 75
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)
TYPE OF WELL ABANDONED: Monitoring
REASON FOR ABANDONMENT: Not Needed
WAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: 11A

TOTAL DEPTH OF WELL 10'
DIAMETER 4"
CASING LENGTH 5'
SCREEN LENGTH 5'
NUMBER OF CASINGS ONE

MATERIAL USED TO SEAL WELL:
120 Gallons of Water
100 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☐ Consolidated
☒ Unconsolidated



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVC
WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

El. Gonzalez A.C. Schultes, Inc. 4/18/94
Name of Person Doing Sealing Work Address Mailing Date
(Print or Type)
El. Gonzalez
Signature of Person Doing Sealing Work License # 5-1449

WELL ABANDONMENT REPORT

MAIL TO:

Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426

WELL PERMIT # 26-20151B
of well sealed

DATE WELL SEALED 4-4-94

PROPERTY OWNER Illianoato Company

ADDRESS Pennsylvania Ave Kearny NJ

WELL LOCATION Pennsylvania Ave Kearny Hudson County
Street & No., Township, County

WW-15D West 74°-06' North 40°-44'
Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: Monitoring

REASON FOR ABANDONMENT: Not needed

WAS A NEW WELL DRILLED? ☐ YES

☒ NO

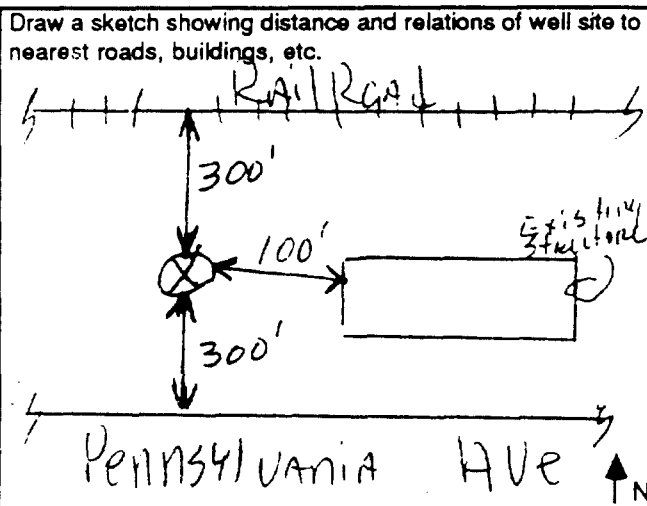
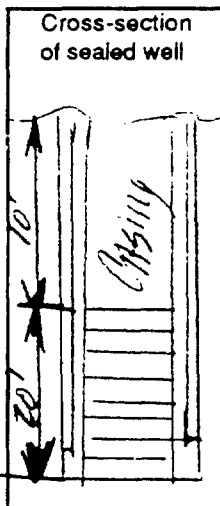
PERMIT # OF NEW WELL: NA

TOTAL DEPTH OF WELL 30'
DIAMETER 4"
SCREEN LENGTH 20'
SCREEN LENGTH 10'
NUMBER OF CASINGS 2

MATERIAL USED TO SEAL WELL:

2.1 Gallons of Water
300 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)

FORMATION: ☒ Consolidated
☐ Unconsolidated



To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO

CASING MATERIAL: PVC / Steel

WERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO

WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)

A.C. Schults, Inc
Address

Eli Gonzalez, Inc
Signature of Person Doing Sealing Work

4/18/94
Mailing Date
J-1449
License #

WELL ABANDONMENT REPORT**MAIL TO:**Bureau of Water Allocation
CN 426
Trenton, NJ 08625-0426WELL PERMIT # 26-201902
of well sealedDATE WELL SEALED 4-4-94PROPERTY OWNER MOLISANO COMPANYADDRESS PENNSYLVANIA AVE EPHRAIM N.J.WELL LOCATION PENNSYLVANIA AVE EPHRAIM HOLLAND COUNTY

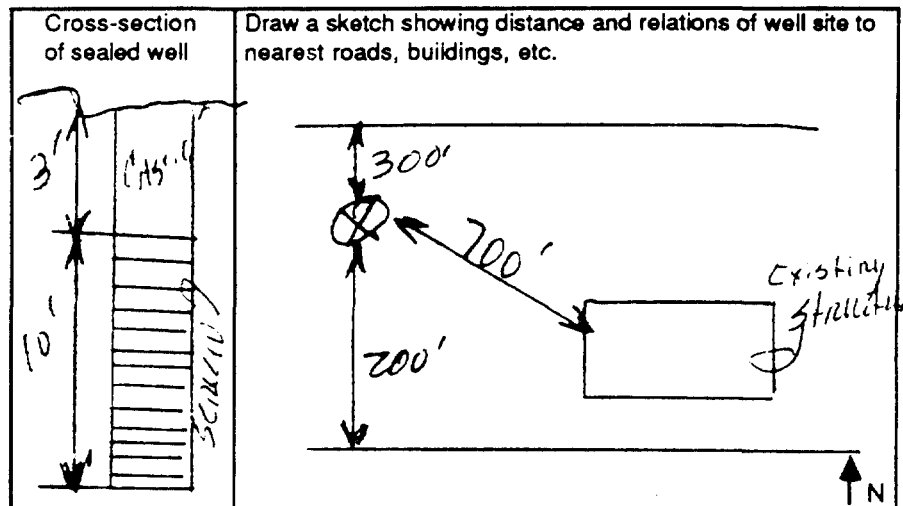
Street & No., Township, County

1111-163 115° 74' 00" North 40° 49'

Well No., Lot & Block No., Longitude & Latitude (N.J. Grid # may be substituted for longitude & latitude)

TYPE OF WELL ABANDONED: MunicipalREASON FOR ABANDONMENT: Not neededWAS A NEW WELL DRILLED? ☐ YES ☒ NO PERMIT # OF NEW WELL: - 11A -TOTAL DEPTH OF WELL 13'
DIAMETER 4"
CASING LENGTH 3'
SCREEN LENGTH 10'
NUMBER OF CASINGS ONE

MATERIAL USED TO SEAL WELL:

7 Gallons of Water
100 Lbs. of Cement
Lbs. of Bentonite
Lbs. of Sand/Gravel
(none if well is contaminated)FORMATION: ☐ Consolidated
☒ Unconsolidated

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☒ YES ☐ NO CASING MATERIAL: PVCWERE OTHER OBSTRUCTIONS REMOVED? ☐ YES ☒ NO WHAT WERE THE OBSTRUCTIONS: None

I certify that this well was sealed in accordance with N.J.A.C. 7:9-9.1 et seq.

Eli Gonzalez
Name of Person Doing Sealing Work
(Print or Type)A.C. Schults, Inc.
Address
Eli Gonzalez/PC
Signature of Person Doing Sealing Work4/18/94
Mailing Date
J-1449
License #

Date: 4/14/94Client: Monsanto CompanyLocation: Kearny, NJ

| MW-Number | MW-8S | MW-8D | MW-10S | MW-10D |
|--------------------|------------|-------------------|-------------|-------------|
| Time | 1205 | 1150 | 1000 | 1045 |
| Weather Conditions | 70F; Sunny | 70F; Sunny | 70F; Sunny | 70F; Sunny |
| Well Permit Number | NA | 26-20144-5 | 26-76391-0 | 26-20146-1 |
| Before Purging | | | | |
| D.T.B. | 12.00 | 29.16 | 15.69 | 30.94 |
| D.T.W. | 5.99 | 7.15 | 3.98 | 8.63 |
| D.T.W.S. | 18.70 | 19.20 | 10.70 | 20.90 |
| W.C. | 6.01 | 22.01 | 11.71 | 22.31 |
| C.V. | 3.92 | 14.37 | 7.64 | 14.56 |
| V.T.P. | 11.77 | 43.10 | 22.93 | 43.69 |
| pH | 5.00 | 6.00 | 5.00 | 5.00 |
| SpC | 2.850 | 5.810 | 0.663 | 1.080 |
| Temp. | 9.3 | 11.6 | 9.7 | 11.3 |
| D.O. | 2.6 | 2.0 | 2.4 | 1.9 |
| After Purging | | | | |
| D.T.W. | 11.09 | 7.70 | 5.90 | 9.31 |
| P.S.T. | 1130 | 1133 | 946 | 1029 |
| P.E.T. | 1145 | 1137 | 953 | 1039 |
| Rate (GPM) | 0.80 | 11.50 | 1.00 | 9.00 |
| Vol. Purged (g) | 12.00 | 46.00 | 7 min rec | 45.00 |
| pH | 5.00 | 7.00 | 5.00 | 5.00 |
| SpC | 1.370 | 6.140 | 0.608 | 1.090 |
| Temp. | 9.2 | 12.3 | 9.9 | 12.4 |
| D.O. | 9.8 | 2.4 | 4.6 | 2.7 |
| Before Sampling | | | | |
| D.T.W. | 9.40 | 7.64 | 5.58 | 9.11 |
| After Sampling | | | | |
| S.S.T. | 1205 | 1150 | 1000 | 1045 |
| S.E.T. | 1210 | 1155 | 1005 | 1050 |
| pH | 5.00 | 6.00 | 5.00 | 5.00 |
| SpC | 1.56 | 6.130 | 0.601 | 1.090 |
| Temp. | 9.20 | 12.3 | 9.9 | 12.5 |
| D.O. | 8.65 | 3.6 | 2.6 | 2.8 |
| Comments: | - | Green water | Sewage odor | Green water |
| | | Solvent-like odor | | Sewage odor |
| Purge Method: | Jet pump | Submersible | Jet Pump | Submersible |

D.T.W. = Depth to Water (ft)

D.T.B. = Depth to Bottom (ft)

D.T.W.S. = Depth to Top of Well Screen (ft)

W.C. = Water Column (ft)

C.V. = Casing Volume (g)

V.T.P. = Volume to Purge (C.V. x 3)

pH = pH

SpC = Specific Conductivity (microsiemens)

Temp. = Temperature (C)

D.O. = Dissolved Oxygen (mg/l)

P.S.T. = Purge Start Time

P.E.T. = Purge End Time

S.S.T. = Sample Start Time

S.E.T. = Sample End Time

NM = Not Measured

Prepared by:

James Vander VlietDate: 9/30/94

Checked by:

[Signature]Date: 11/14/94

850131552

Date: 4/14/94Client: Monsanto CompanyLocation: Kearny, NJ

| MW-Number | MW-13S | MW-13D | MW-14S | MW-14D |
|--------------------|------------------|--------------------|-------------|----------------|
| Time | 1415 | 1440 | 1255 | 1320 |
| Weather Conditions | 70F; Sunny | 70F; Sunny | 70F; Sunny | 70F; Sunny |
| Well Permit Number | 26-20138-1 | 26-20149-6 | 26-20141-1 | 26-20150-0 |
| Before Purging | | | | |
| D.T.B. | 11.61 | 32.40 | 12.45 | 29.55 |
| D.T.W. | 4.50 | 9.27 | 4.94 | 8.46 |
| D.T.W.S. | 4.60 | 22.40 | 5.50 | 19.60 |
| W.C. | 7.11 | 23.13 | 7.51 | 21.09 |
| C.V. | 4.64 | 15.10 | 4.90 | 13.77 |
| V.T.P. | 13.92 | 45.30 | 14.71 | 41.30 |
| pH | 5.00 | 6.00 | 5.00 | 6.00 |
| SpC | 0.935 | 3.930 | 0.260 | 6.950 |
| Temp. | 10.4 | 11.9 | 10.1 | 12.3 |
| D.O. | 3.1 | 2.3 | 1.8 | 2.5 |
| After Purging | | | | |
| D.T.W. | 9.21 | 10.92 | 6.38 | 9.05 |
| P.S.T. | 1402 | 1430 | 1230 | 1309 |
| P.E.T. | 1408 | 1433 | 1241 | 1312 |
| Rate (GPM) | 1.00 | 15.00 | 1.82 | 11.25 |
| Vol. Purged (g) | 7 min rec | 45.00 | 20.00 | 45.00 |
| pH | 5.00 | 6.00 | 6.00 | 6.00 |
| SpC | 0.588 | 5.560 | 0.813 | 7.070 |
| Temp. | 10.1 | 13.4 | 9.3 | 12.9 |
| D.O. | 4.2 | 2.6 | 3.2 | 2.8 |
| Before Sampling | | | | |
| D.T.W. | 5.75 | 10.40 | 5.42 | 8.89 |
| After Sampling | | | | |
| S.S.T. | 1415 | 1440 | 1255 | 1320 |
| S.E.T. | 1420 | 1445 | 1300 | 1325 |
| pH | 5.00 | 6.00 | 6.00 | 6.00 |
| SpC | 0.525 | 5.860 | 0.813 | 7.070 |
| Temp. | 10.2 | 13.5 | 9.8 | 12.4 |
| D.O. | 2.9 | 3.5 | 3.4 | 3.2 |
| Comments: | Grey/brown water | Slight yellow tint | Brown water | Yellow tint to |
| | | to water | Sewage odor | water |
| | | | | Sewage odor |
| Purge Method: | Jet Pump | Submersible | Jet Pump | Submersible |

D.T.W. = Depth to Water (ft)

D.T.B. = Depth to Bottom (ft)

D.T.W.S. = Depth to Top of Well Screen (ft)

W.C. = Water Column (ft)

C.V. = Casing Volume (g)

V.T.P. = Volume to Purge (C.V. x 3)

pH = pH

SpC = Specific Conductivity (microsieme)

Temp. = Temperature (C)

D.O. = Dissolved Oxygen (mg/l)

P.S.T. = Purge Start Time

P.E.T. = Purge End Time

S.S.T. = Sample Start Time

S.E.T. = Sample End Time

NM = Not Measured

Prepared by:

James Vander VlietDate: 9/30/94

Checked by:

Steph YoungDate: 11/10/94

850131553

Date: 8/2/94Client: Monsanto CompanyLocation: Keamy, NJ

| MW-Number | MW-8S | MW-8D | MW-10S | MW-10D |
|--------------------|-------------------|----------------------|-----------------|---------------|
| Time | 1530 | 1455 | 1205 | 1145 |
| Weather Conditions | 75F; Overcast | 75F; Overcast | 75F; Overcast | 75F; Overcast |
| Well Permit Number | NA | 26-20144-5 | 26-76391-0 | 26-20146-1 |
| Before Purging | | | | |
| D.T.B. | 12.00 | 29.16 | 15.69 | 30.94 |
| D.T.W. | 6.54 | 7.36 | 6.13 | 8.98 |
| D.T.W.S. | 18.70 | 19.20 | 10.70 | 20.90 |
| W.C. | 5.46 | 21.80 | 9.58 | 21.96 |
| C.V. | 3.56 | 14.23 | 6.24 | 14.34 |
| V.T.P. | 10.69 | 42.69 | 18.72 | 43.01 |
| pH | 6.81 | 6.85 | 7.10 | 6.36 |
| SpC | 2.420 | 4.870 | 0.487 | 0.800 |
| Temp. | 69.8 | 68.6 | 66.2 | 66.6 |
| D.O. | 1.8 | 2.1 | 1.7 | 1.6 |
| After Purging | | | | |
| D.T.W. | 10.88 | 7.63 | 7.32 | 9.07 |
| P.S.T. | 1440 | 1440 | 1156 | 1127 |
| P.E.T. | 1450 | 1444 | 1201 | 1131 |
| Rate (GPM) | 0.60 | 11.00 | 4.00 | 8.40 |
| Vol. Purged (g) | 6 min rec | 44.00 | 20.00 | 42.00 |
| pH | 6.82 | 6.61 | 6.57 | 6.51 |
| SpC | 1.840 | 6.950 | 0.619 | 3.180 |
| Temp. | 67.5 | 62.7 | 60.7 | 61.5 |
| D.O. | 5.9 | 2.8 | 2.8 | 2.7 |
| Before Sampling | | | | |
| D.T.W. | 7.56 | 7.45 | 6.17 | 9.04 |
| After Sampling | | | | |
| S.S.T. | 1530 | 1455 | 1205 | 1145 |
| S.E.T. | 1535 | 1500 | 1210 | 1150 |
| pH | NM | 6.64 | 6.65 | 6.54 |
| SpC | NM | 7.190 | 0.619 | 3.480 |
| Temp. | NM | 57.0 | 58.0 | 60.2 |
| D.O. | NM | 4.3 | 4.2 | 2.8 |
| Comments: | Cloudy grey water | Yellow tint to water | Brown water | Brown water |
| | | Sewage odor | purged to clear | Sewage odor |
| | | | Sewage odor | |
| Purge Method: | Jet pump | Submersible | Jet Pump | Submersible |

D.T.W. = Depth to Water (ft)
 D.T.B. = Depth to Bottom (ft)
 D.T.W.S. = Depth to Top of Well Screen (ft)
 W.C. = Water Column (ft)
 C.V. = Casing Volume (g)
 V.T.P. = Volume to Purge (C.V. x 3)
 pH = pH

SpC = Specific Conductivity (microsiemen)
 Temp. = Temperature (F)
 D.O. = Dissolved Oxygen (mg/l)
 P.S.T. = Purge Start Time
 P.E.T. = Purge End Time
 S.S.T. = Sample Start Time
 S.E.T. = Sample End Time
 NM = Not Measured

Prepared by: James Vander Vliet
 Checked by: Philip Chang

Date: 9/30/94
 Date: 10/27/94

850131554

Date: 8/2/94Client: Monsanto CompanyLocation: Kearny, NJ

| MW-Number | MW-13S | MW-13D | MW-14S | MW-14D |
|--------------------|-----------------|---------------|---------------|---------------------|
| Time | 1310 | 1255 | 1540 | 1545 |
| Weather Conditions | 75F; Overcast | 75F; Overcast | 75F; Overcast | 75F; Overcast |
| Well Permit Number | 26-20138-1 | 26-20149-6 | 26-20141-1 | 26-20150-0 |
| Before Purging | | | | |
| D.T.B. | 11.61 | 32.40 | 12.45 | 29.55 |
| D.T.W. | 5.04 | 10.46 | 5.33 | 8.55 |
| D.T.W.S. | 4.60 | 22.40 | 5.50 | 19.60 |
| W.C. | 6.57 | 21.94 | 7.12 | 21.00 |
| C.V. | 4.29 | 14.32 | 4.65 | 13.71 |
| V.T.P. | 12.87 | 42.97 | 13.94 | 41.13 |
| pH | 6.69 | 6.97 | 7.24 | 6.83 |
| SpC | 0.877 | 5.570 | 0.654 | 6.220 |
| Temp. | 69.2 | 62.7 | 71.2 | 67.2 |
| D.O. | 3.1 | 2.4 | 2.7 | 2.3 |
| After Purging | | | | |
| D.T.W. | 10.10 | 10.77 | 5.33 | 8.55 |
| P.S.T. | 1251 | 1244 | 1526 | 1526 |
| P.E.T. | 1300 | 1248 | 1535 | 1530 |
| Rate (GPM) | 0.75 | 9.75 | 1.11 | 10.75 |
| Vol. Purged (g) | 7 min rec | 39.00 | 10.00 | 43.00 |
| pH | 6.74 | 7.01 | 6.92 | 6.86 |
| SpC | 0.739 | 7.180 | 0.830 | 6.300 |
| Temp. | 66.2 | 58.6 | 68.8 | 64.8 |
| D.O. | 5.2 | 4.3 | 2.6 | 2.9 |
| Before Sampling | | | | |
| D.T.W. | 6.13 | 10.58 | 5.33 | 8.55 |
| After Sampling | | | | |
| S.S.T. | 1310 | 1255 | 1540 | 1545 |
| S.E.T. | 1315 | 1300 | 1545 | 1550 |
| pH | 6.79 | 7.02 | 7.02 | 6.88 |
| SpC | 0.741 | 7.180 | 0.880 | 6.300 |
| Temp. | 63.3 | 57.4 | 67.0 | 65.0 |
| D.O. | 3.9 | 6.4 | 3.1 | 4.6 |
| Comments: | Dark grey water | Brown water | - | Green tint to water |
| | | Sewage odor | | |
| Purge Method: | Jet Pump | Submersible | Jet Pump | Submersible |

D.T.W. = Depth to Water (ft)

D.T.B. = Depth to Bottom (ft)

D.T.W.S. = Depth to Top of Well Screen (ft)

W.C. = Water Column (ft)

C.V. = Casing Volume (g)

V.T.P. = Volume to Purge (C.V. x 3)

pH = pH

SpC = Specific Conductivity (microsieme)

Temp. = Temperature (F)

D.O. = Dissolved Oxygen (mg/l)

P.S.T. = Purge Start Time

P.E.T. = Purge End Time

S.S.T. = Sample Start Time

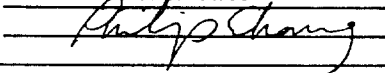
S.E.T. = Sample End Time

NM = Not Measured

Prepared by:

James Vander Vliet

Checked by:

Date: 9/30/94Date: 10/27/94

850131555



HUDSON-ESSEX-PASSAIC SOIL CONSERVATION DISTRICT

571 BLOOMFIELD AVE.
VERONA, N.J. 07044
Telephone: (201) 239-1886

October 7, 1993

Monsanto Company
Pennsylvania Avenue
Kearny, NJ 07032

Re: Monsanto Kearny Remedial Action
Pennsylvania Avenue, Kearny NJ
Drwg. dtd. 9/21/93

Dear Madam/Sir:

We have reviewed the soil erosion and sediment control plan for the above referenced project, and are pleased to report it meets the requirements as prescribed by the Soil Erosion and Sediment Control Act, Chapter 251, P.L. 1975. Accordingly it has been certified by the Hudson-Essex-Passaic Soil Conservation District.

Please note that you are required to notify us by registered mail at least 48 hours prior to any land disturbing activity. Also, notification is required prior to obtaining any certificate of occupancy from the respective municipality. A final inspection will be performed to insure that the project has been stabilized as per the certified erosion control plan. The municipality will require the final Report of Compliance prior to releasing any Certificates of occupancy. Also be reminded that the Act authorizes penalties of a stop construction order, injunctive relief, and fines of not more than \$3000 per day for violations or lack of compliance with the certified plan or for failure to notify the District of any land disturbing activity. Any conveyance of this project or portion thereof prior to it's completion will transfer full responsibility for compliance with the certified plan to any subsequent owners. Written notification is required for any change of ownership or sale of individual building lots.

Feel free to contact our office for any assistance you may need in implementing the plan, especially when changes in the amount and duration of soil exposure are forced by unforeseen circumstances.

This Certification is valid for 3 1/2 years.

Very truly yours,

Board of Supervisors

c: Municipal Planning Board
Construction Official
File Number: 93-H-1055
Plan Prepared by: Roux Associates

850131557



HUDSON-ESSEX-PASSAIC SOIL CONSERVATION DISTRICT

571 BLOOMFIELD AVE.
VERONA, N.J. 07044
Telephone: (201) 239-1886

REPORT OF COMPLIANCE

August 22, 1994

Ray Narwid, Construction Official
Town of Kearny
400 Kearny Avenue
Kearny, New Jersey 07043

Re: Monsanto Company Remedial Action
Pennsylvania Avenue, Kearny

Dear Mr. Narwid:

Please be advised that the construction of the above mentioned project has been completed according to the Soil Erosion and Sediment Control Plan certified by the District, pursuant to the Soil Erosion and Sediment Control Act, Chapter 251, P.L. 1975. The Hudson-Essex-Passaic Soil Conservation District thereby issues a REPORT OF COMPLIANCE with the soil erosion and sediment control plan and authorizes the issuance of a Certificate of Occupancy for the above mentioned project. In cases where a certificate is not necessary, this letter shall serve to notify that the above project has been completed and stabilized.

This Report of Compliance applies only to provisions of the Soil Erosion and Sediment Control Act and does not obligate the Construction Official to issue a Certificate of Occupancy.

Yours truly,

Glen Van Olden
Director

c: Owner ✓

850131558



Notice of Authorization

| Permit No. | Issuance Date | Effective Date | Expiration Date |
|----------------|---------------|----------------|-----------------|
| 0907-94-0002.1 | 04/15/94 | 04/15/94 | 04/15/99 |
| 0907-94-0002.2 | | | |

| Issued To | For Activity/Facility At | Owner |
|-------------------------------------------------------------|---------------------------------------------------------------------|----------------------|
| Monsanto Company
Pennsylvania Avenue
Kearny, NJ 07032 | Monsanto Kearny Plant
Kearny, Hudson County
Lot 49; Block 284 | Same as
applicant |

| Issuing Division | Type of Permit | Statute(s) | Application No. |
|--------------------------------|-----------------------------------------------|-------------------------------|-----------------|
| Land Use Regulation
Program | Waterfront Development
Stream Encroachment | NJSA 12:5-3
NJSA 58:16A-50 | |

A Permit to

perform remedial activities in accordance with Administrative Consent Order (Docket # C-17649-88), including the installation of steel sheet piling, temporary lowering of the groundwater table, excavation of contaminated soils from three areas, backfilling of the excavations to grade, and the installation of an asphalt cap over approximately two acres of the site.

DEPE Authorization

DEPE-008
4/92

Robert B. Piel, Jr., Manager

This Notice Must be Conspicuously Displayed At The Activity/Facility Site

New Jersey Department of Environmental Protection and Energy

850131560

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES



DEWATERING SYSTEM PERMIT

Water Allocation
CN 029
Trenton, N.J. 08625-0029

Permit No. DSP-0114

Kearney Site Remediation Project

Project Name
Kearney Hudson, New Jersey

Location (Township, County)

Project Number
Monsanto Co

Owner's Name
1 Pennsylvania Avenue

Owner's Address
Kearney, NJ 07032

George Cinquegrana D-0074

Licensed Dewatering Contractor/Well Driller
24 Cannery Road

Address
Somerville, New Jersey 08876

Dewatering Contractor's Tel. #
(908) 534-1664

Contact Person/Telephone #
George Cinquegrana

REASON FOR DEWATERING (sewer const., water treatment facility, etc.) Soil Remediation

PROPOSED DEWATERING WELL/ WELL POINT CONSTRUCTION:

Number of Wells 6 Well Points _____
Maximum Depth of Wells 30 ft./ Well Points _____ ft.
Diameter of Casing 12 in./ Well Points _____ in.
Combined Capacity of Wells/ Well Points 20/40 GPM
Method of Drilling (cable-tool, rotary, auger, etc.) Bucket Auger

ATTACH A SITE PLAN MAP OR SKETCH OF PROPOSED WELL/ WELL POINT LOCATIONS

State Atlas Sheet # X26 Latitude & Longitude 74 10'00" 40 45' 00" lat.

CONDITIONS:

This permit is **NOT VALID** until a Water Allocation Permit is obtained for this project.

(Owner of dewatering project is responsible for obtaining a Water Allocation Permit Application for Temporary Dewatering Projects)

Other WATER ALLOCATION Permit NOT NEEDED

PLEASE NOTE ATTACHED LETTER

THIS SPACE FOR
WELL APPROVAL STAMP
Dept. of Environmental Protection
Water Resources/ Water Allocation

MAY 3 1994

Signature of Owner

Date

Signature of Licensed Dewatering Contractor/Well Driller

Date

New Jersey Department of Environmental Protection
Division of Water Resources



DEWATERING SYSTEM

WELL RECORD

Mail to: Water Allocation
CN 029
Trenton, N.J. 08625-0029

PROJECT NAME WATER ALLOCATION PROJECT PERMIT # 102-111

PROJECT LOCATION CLAYTON, NEW JERSEY
Street, Township, County

NUMBER OF DEWATERING WELLS INSTALLED 6

NUMBER OF DEWATERING WELL POINTS INSTALLED _____

TOTAL PUMP CAPACITY OF PROJECT 20/40 GPM _____ GPD

DEPTH OF WELLS 50' 15" DEPTH OF WELL POINTS _____

WELL/WELL POINT LOG

SEE ATTACHED

Information on all dewatering wells/well points shall be submitted on individual well record forms when dissimilar geologic strata, bedrock, methane gas and/or contaminated water is encountered.

LICENSED DEWATERING CONTRACTOR'S/
WELL DRILLER'S NAME

GEORGE C. INGLEMANA
(Please Print or Type)

LICENSED DEWATERING CONTRACTOR'S/
WELL DRILLER'S SIGNATURE

[Signature]

DATE: 7/20/94

DATE: 5/25/94
PAGE No. 1 OF 1
JOB No. _____
RIG No. NICKS
L Dewatering

WELL PERMIT NO. DSP-0114

PTES, DELAYS (explain): on site 7:00, attended
- after meeting, vibrated can out, set up and
drilled #4, hit ptat @ 12', drilled to 13'
set + sealed well, washed Rig + tools w/ 2"
Use then moved over to decon Pad and
deconned, Rolled hoses up loaded up, deconned
- f blo @ 100.

| | Depth to
top (Ft)
(From land surface) | Depth to
bottom (Ft) | Diameter
(In) | Type and Material |
|----------------------------------------------------------------|---------------------------------------------|-------------------------|------------------|-------------------|
| Inner Casing | | | | |
| Outer Casing Well Risers
(Non Protective Casing) | +2 | 3' | 12" | PVC |
| Screen
(Note slot size) | 3' | 13' | 12" | PVC .050 |
| Tail Piece | | | | |
| Gravel Pack | surface | 13' | | 1/4" to 1/8" grit |
| Annular Seal/Grout | | | | |
| Method of Grouting | | | | |

WELL LOG

[illegible]

Tom Zbinden / E.D. STC
DRILLER/HELPER
X [Signature] /
VERIFIED CONTRACTOR

COPIES TO:

WHITE & CANARY - ROCKAWAY

PINK - CONTRACTOR

GOLDENROD-DRILLER

850131564

DATE: 5/23/94
PAGE No. 1 OF 2
JOB No. _____
RIG No. Nicks
L Demolishing

WELL PERMIT NO. DSP-0114

Total Depth Drilled 14' Ft
Well finished to 14' Ft

Top 30 In.
Bottom 24 In.

[4] Above Grade

— [] Flush Mounted

If finished above grade, casing height (stick up) above land surface 7.4 Ft

Was steel protective casing installed? ☐ Yes ☐ No

Static water level after drilling _____ Ft

W-1 was developed for _____ hours at _____ gpm

Method of development

Travel Hours _____ Standby Hours _____

M... Hours Regular Drill Hours Reg 8

Man Hours OT _____ Rig Hours OT _____

NOTES, DELAYS (explain): @ Shop 5:00 loaded Haze's

~~1~~ - on on truck moved to site on site @ 7:00
 Had Safety Meeting + Health and Safety briefing
 1 - up on 1st hole, set 36" can to 7' from Grd,
 hole kept caving around can, called Shop @ 10:30
 for 15' can (30") to be delivered, will change to
 2' Bucket, can Arrived @ 12:30, Drilled hole's
 #3 and #1, set and Sanded, moved Rig over
 to location, worked till 3:30.

:- Had to make Access for Each Location

| | Depth to
top (Ft)
(From land surface) | Depth to
bottom (Ft) | Diameter
(In) | Type and Material |
|--------------------------------------------------------------|---------------------------------------------|-------------------------|------------------|-------------------|
| Inner Casing | | | | |
| Outer Casing well Rise
(Non Protective Casing) | + 1' | 4' | 12" | PVC |
| Screen
(Note slot size) | 4' | 14' | 12" | PVC .050 |
| Tail Piece | | | | |
| Gravel Pack | Surface | 14' | | 1/4" - 3/8" Grt |
| Annular Seal/Grout | | | | |
| Method of Grouting | | | | |

[illegible]

Tom Kline ED STC
DRILLER/HELPER
Raymond J. Kline
VERIFIED CONTRACTOR

COPIES TO:

WHITE & CANARY - ROCKAWAY

PINK - CONTRACTOR

GOLDENROD-DRILLER

APSS

850131565

DATE: 5/3/94
PAGE No. 2 OF 2
JOB No. _____
RIG No. NICKS -
L Dewatering

ITE: MASANTO Corp 11-1

TYPE OF WELL Dewatering

WELL PERMIT No. DSP-0114

Total Depth Drilled 141 Ft

Well finished to 14' Ft

orehole diameter:

Top 24' In.
Bottom 24 In.

ell was finished:

[4] Above Grade

☐ Flush Mounted

finished above grade, casing height (stick up) above land surface 4 Ft

Was steel protective casing installed? ☐ Yes ☐ No

| Static water level after drilling | Ft |
|-----------------------------------|------|
| 1 | 10.0 |
| 2 | 10.0 |
| 3 | 10.0 |
| 4 | 10.0 |
| 5 | 10.0 |
| 6 | 10.0 |
| 7 | 10.0 |
| 8 | 10.0 |
| 9 | 10.0 |
| 10 | 10.0 |
| 11 | 10.0 |
| 12 | 10.0 |
| 13 | 10.0 |
| 14 | 10.0 |
| 15 | 10.0 |
| 16 | 10.0 |
| 17 | 10.0 |
| 18 | 10.0 |
| 19 | 10.0 |
| 20 | 10.0 |
| 21 | 10.0 |
| 22 | 10.0 |
| 23 | 10.0 |
| 24 | 10.0 |
| 25 | 10.0 |
| 26 | 10.0 |
| 27 | 10.0 |
| 28 | 10.0 |
| 29 | 10.0 |
| 30 | 10.0 |
| 31 | 10.0 |
| 32 | 10.0 |
| 33 | 10.0 |
| 34 | 10.0 |
| 35 | 10.0 |
| 36 | 10.0 |
| 37 | 10.0 |
| 38 | 10.0 |
| 39 | 10.0 |
| 40 | 10.0 |
| 41 | 10.0 |
| 42 | 10.0 |
| 43 | 10.0 |
| 44 | 10.0 |
| 45 | 10.0 |
| 46 | 10.0 |
| 47 | 10.0 |
| 48 | 10.0 |
| 49 | 10.0 |
| 50 | 10.0 |
| 51 | 10.0 |
| 52 | 10.0 |
| 53 | 10.0 |
| 54 | 10.0 |
| 55 | 10.0 |
| 56 | 10.0 |
| 57 | 10.0 |
| 58 | 10.0 |
| 59 | 10.0 |
| 60 | 10.0 |
| 61 | 10.0 |
| 62 | 10.0 |
| 63 | 10.0 |
| 64 | 10.0 |
| 65 | 10.0 |
| 66 | 10.0 |
| 67 | 10.0 |
| 68 | 10.0 |
| 69 | 10.0 |
| 70 | 10.0 |
| 71 | 10.0 |
| 72 | 10.0 |
| 73 | 10.0 |
| 74 | 10.0 |
| 75 | 10.0 |
| 76 | 10.0 |
| 77 | 10.0 |
| 78 | 10.0 |
| 79 | 10.0 |
| 80 | 10.0 |
| 81 | 10.0 |
| 82 | 10.0 |
| 83 | 10.0 |
| 84 | 10.0 |
| 85 | 10.0 |
| 86 | 10.0 |
| 87 | 10.0 |
| 88 | 10.0 |
| 89 | 10.0 |
| 90 | 10.0 |
| 91 | 10.0 |
| 92 | 10.0 |
| 93 | 10.0 |
| 94 | 10.0 |
| 95 | 10.0 |
| 96 | 10.0 |
| 97 | 10.0 |
| 98 | 10.0 |
| 99 | 10.0 |
| 100 | 10.0 |

Well was developed for _____ hours at _____ gpm

Method of development

Travel Hours _____ Standby Hours _____

| Jan Hours Regular | Drill Hours Reg |
|-------------------|-----------------|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 16 | 16 |
| 17 | 17 |
| 18 | 18 |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 29 | 29 |
| 30 | 30 |
| 31 | 31 |

Man Hours OT _____ Rig Hours OT _____

NOTES, DELAYS (explain):

| | Depth to top (Ft)
(From land surface) | Depth to bottom (Ft) | Diameter (In) | Type and Material |
|---------------------------------------------------|------------------------------------------|----------------------|---------------|-------------------|
| Inner Casing | | | | |
| Outer Casing well RISR
(Non-Protective Casing) | +1' | 4' | 12" | PVC |
| Screen
(Note slot size) | 4' | 14' | 12" | .050 PVC |
| Tail Piece | | | | |
| Gravel Pack | surface | 14' | | 1/4" to 1/8" Grit |
| Annular Seal/Grout | | | | |
| Method of Grouting | | | | |

[illegible]

Tom Alins / ED STec

~~DRILLER/HELPER~~

VERIFIED CONTRACTOR

COPIES TO:

WHITE & CANARY - ROCKAWAY

PINK - CONTRACTOR

GOLDENROD-DRILLER

SSP

850131566

DATE: 5/24/94
PAGE No. 1 OF 3
JOB No. _____
RIG No. A.CK5
L Dewatering

WELL PERMIT NO. DSP-0114

NOTES, DELAYS (explain): on site 7:00, attended
- After meeting, set up and drilled #2, to
15', made access to #3, waited for Dock builder to
- Drive 2 sheets set up drilled to 30', set + sanded
moved to #5, set up drilled to 14', set +
- sanded well. Went to pull can, Broke 2 steel
- hooks + pull shackle thru eye hole, will vibrate
it out in A.M. (Same thing happened @ #6)
Backed Rig over #4, worked till 3:00 no lunch.

| | Depth to
top (Ft)
(From land surface) | Depth to
bottom (Ft) | Diameter
(In) | Type and Material |
|-----------------------------------------------------------------|---------------------------------------------|-------------------------|------------------|-----------------------------------------|
| Inner Casing | | | | |
| Outer Casing ^{well R. size}
(Non Protective Casing) | surface | 5' | 12" | PVC |
| Screen
(Note slot size) | 5' | 15' | 12" | PVC .050 |
| Tail Piece | | | | |
| Gravel Pack | surface | 15' | | $\frac{1}{4}$ " to $\frac{1}{2}$ " Grit |
| Annular Seal/Grout | | | | |
| Method of Grouting | | | | |

WELL LOG

[illegible]

Tom King / ED stec

~~DRILLER/HELPER~~

VERIFIED CONTRACTOR

COPIES TO:

WHITE & CANARY - ROCKAWAY

PINK - CONTRACTOR

GOLDENROD-DRILLER

850131567

ORETRENCH WELL REPORTS

DATE: 5/24/98

PAGE No. 2 OF 3

JOB No. _____

RIG No. NICKS

CONTRACTOR: Bar Bella

SITE: Mosanto Corp

WELL ID No. #6 TYPE OF

TYPE OF WELL Dewatering

WELL PERMIT NO. DSP-0114

Well Construction

Total Depth Drilled 30 Ft

Well finished to 30' Ft

Borehole diameter:

Top 24" In.
Bottom 24" In.

Well was finished:

[4] Above Grade

☐ Flush Mounted

Finished above grade, casing height (stick up) above land surface _____ Ft

Was steel protective casing installed? ☐ Yes ☐ No

Static water level after drilling _____ Ft

Well was developed for _____ hours at _____ gpm

Method of development_____

Travel Hours _____ Standby Hours _____

Man Hours Regular _____ Drill Hours Reg _____

Men Hours OT _____ Rig Hours OT _____

NOTES, DELAYS (explain):

WELL LOG

[illegible]

Tom Ylin / ED Sec

DRILLER HELPER

VERIFIED CONTRACTOR

850131568

COPIES TO:

WHITE & CANARY - ROCKAWAY.

PINK - CONTRACTOR

GOLDENROD-DRILLER



WELL/WELL POINT ABANDONMENT FORM

Mail to: Water Allocation
CN 029
Trenton, N.J. 08625-0029

PERMIT # _____

PROJECT NAME _____

ADDRESS _____
Street, Township, County

LOCATION OF WELLS/WELL POINTS 1 PENNSYLVANIA AVE, Kearny, Hudson, N.J.
Street, Township, County

FORMATION: ☒ Unconsolidated ☐ Consolidated

NUMBER OF WELL POINTS SEALED _____
Diameter _____

NUMBER OF WELLS SEALED 6
Diameter 12"

WAS CASING LEFT IN PLACE? ☒ Yes ☐ No

If "No" is checked, indicate number of pounds of Bentonite used for plug
(Minimum of 3 feet plug, followed by backfill to grade) _____ Pounds of Bentonite

If "Yes" is checked, answer the following questions:

SEALING MIXTURE (Circle One)

- a) Neat Cement
- b) Cement-bentonite
- c) Bentonite
- d) Other

MATERIAL USED:

_____ Gallons of Water
_____ Pounds of Cement
_____ Pounds of Bentonite

GEORGE P. [Signature]
Name of Person Doing Sealing Work/Employer

D-0074
License Number

[Signature]
Signature of Person Doing Sealing Work

24 TANNERY RD.
Address
SOMERVILLE, N.J.

7/20/94
DATE WELL/WELL POINTS WERE SEALED

850131571



State of New Jersey
Department of Environmental Protection and Energy

Robert C. Shinn, Jr.
Commissioner

MAR 28 1994

Celso A. Balan, Site Manager
Monsanto Chemical Company
Pennsylvania Avenue
Kearny, New Jersey 07032

Dear Mr. Balan:

**RE: Monsanto Chemical Company, Kearny, Hudson County (Monsanto)
Response to NJDEPE November 18, 1993 Comments, received December 23, 1993
Discharge to Ground Water Permit and Treatment Works Approval Waiver
Administrative Consent Order (ACO) executed on July 24, 1989**

The New Jersey Department of Environmental Protection and Energy (Department or NJDEPE) has reviewed the abovementioned document and hereby approves the revised Remedial Action Work Plan (RAWP). The NJDEPE has outlined the following conditions in order for Monsanto to obtain a NJPDES-DGW and TWA waiver as per Monsanto's verbal request of March 9, 1994 and written requests of March 17, 1994 and March 22, 1994.

The Department authorizes the discharge of the ground water generated during dewatering of the three Areas of Concern (AOCs), as proposed in the RAWP, for contaminated soil excavation at the above referenced site. The NJDEPE understands that the proposed dewatering activities is an appropriate method to efficiently prepare the contaminated soils within and below the affected underlying aquifers to eliminate excess moisture. **This process will be done consequently to the installation of sheet piling firmly keyed into the underlying impermeable layer around the perimeter of each AOC.**

The proposed discharge to ground water and treatment works is approved provided that the following conditions are met:

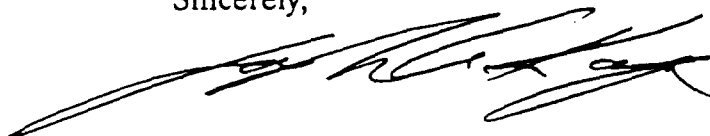
- 1) The ground water discharge remains within the confines of the existing infiltration trench. An alternative infiltration trench may be selected if conditions warrant it.
- 2) If free floating product is encountered during the excavation, the free floating product must first be discharged directly into an oil/water separator.

Celso A. Balan
Monsanto Chemical Company

- 3) The ground water flow rates should not exceed 70 gallons per minute or 100,000 gallons per day.
- 4) The protocols outlined in the March 22, 1994 letter must be followed to assure that flooding and migration to surface water bodies does not occur.

If for some reason that the above conditions cannot be met, please immediately notify the Department in writing detailing any substantial deviations from the above conditions. Should you have any questions regarding this correspondence, please contact the case manager, Mr. Glenn Savary of my staff at (609) 633-0719.

Sincerely,



Joseph A. Karpa, Section Supervisor
Bureau of State Case Management

c: * Peter Palko, Roux Associates
Glenn Savary, BSCM
David VanEck, BGWPA
Steve Byrnes, BEERA
CHRON

RPCE\HEC1\MONSA13.GRS

CONSTRUCTION CODE
ENFORCEMENT DEPARTMENT
KEARNY, N. J.



CONSTRUCTION
PERMIT

Date Issued _____
Control # _____
Permit # **20534**

IDENTIFICATION Block _____ Lot _____

Work Site Location _____ Contractor _____
Address _____
Owner in Fee _____
Address _____
Tele. (____) _____
Lic. No. or Bldrs. Reg. No. _____ Exp. Date _____
Federal Emp. No. _____
or Social Security No. _____

is hereby granted permission to perform the following work:

☒ BUILDING ☐ PLUMBING ☐ OTHER H
☐ ELECTRICAL ☐ FIRE PROTECTION
☐ ELEVATOR DEVICES

DESCRIPTION OF WORK:

3rd floor kitchen terrace. In
connection with work for interior.

NOTE: If construction does not commence within one (1) year of date of issuance, or
construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$ 6000

CONSTRUCTION OFFICIAL

| PAYMENTS (Office Use Only) | |
|----------------------------|---------------|
| Building | _____ |
| Electrical | _____ |
| Plumbing | _____ |
| Fire Protection | _____ |
| Elevator Devices | _____ |
| Other | _____ |
| DCA Training Fee | _____ |
| Cert. of Occ. | <u>720</u> |
| Other | _____ |
| Total | _____ |
| Check No. | <u>100211</u> |
| Cash | _____ |
| Collected By: | <u>MLU</u> |

(see reverse side)

U.C.C. Form F-170C

Light Green = Office Copy • White = Tax Assessor Copy • Yellow/Orange = Applicant Copy

850131576

CONSTRUCTION CODE
ENFORCEMENT DEPARTMENT
KEARNY, N. J.



Date Received 4/15/94
Date Issued
Control #
Permit # 20534

850131577

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 289 Lot 18
Work Site Location Pennsylvania Ave
(10-60)
Owner in Fee Insurance
Address 10-50 Pennsylvania Ave
Tele (N.J.) 157-1778
Contractor 255 Business Center Dr. Suite A
Address Westinghouse
Arsenal Dr. 19044
Tele ()
Lic. No. or Bldrs. Reg. No.
Federal Emp. No. or Social Security No.

JOB SUMMARY (Office Use Only)

| PLAN REVIEW | Date | Initial | INSPECTIONS | Dates (Month/Day) | Initial |
|---------------------------------------------------------------------------------------------|------|---------|-------------|-------------------|----------|
| <input type="checkbox"/> No Plans Req. | | | Type: | Failure | Approval |
| <input type="checkbox"/> All | | | Footing | | |
| <input type="checkbox"/> Footing | | | Foundation | | |
| <input type="checkbox"/> Foundation | | | Slab | | |
| <input type="checkbox"/> Frame | | | Frame | | |
| <input type="checkbox"/> Other | | | Insulation | | |
| Joint Plan Review Required: | | | Finishes: | | |
| <input type="checkbox"/> Elec <input type="checkbox"/> Plumb. <input type="checkbox"/> Fire | | | Energy | | |
| SUBCODE APPROVAL | | | Mechanical | | |
| <input type="checkbox"/> CO <input type="checkbox"/> CCO <input type="checkbox"/> CA | | | TCO | | |
| Date: | | | Other | | |
| Approved By: | | | Final | | |

B. BUILDING CHARACTERISTICS

Use Group Present _____ Proposed W
Constr. Class Present _____ Proposed _____
No. of Stories _____
Height of Structure _____ Ft.
Area—Largest Floor _____ Sq. Ft.
New Bldg. Area/All Floors _____ Sq. Ft.
Volume New Structure _____ Cu. Ft.
Total Bldg. Area _____

Est. Cost of Bldg. Work:

1. New Bldg. \$ _____
2. Alteration \$ _____
3. Total (1+2) \$ 600

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Robert C. Sugar
Signature

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

Install 3 office trailer
and remediate site
10x48 Soil # 034529
10x48 034146
8x32 033214

TYPE OF WORK:

☐ New Building
☐ Addition
☐ Alteration
☐ Roofing
☐ Siding
☐ Fence _____ Height (6' or over)
☐ Sign _____ Sq. Ft.
☐ Pool
☐ Asbestos Abatement
☐ Other certificate of occupancy
☐ Other 30 240 per
☐ Demolition

(Office Use C
FEE

\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ _____
\$ 720

Administrative Surcharge \$ _____
Paid 14 Check # 100211 Minimum Fee \$ _____
Collected by: 4001 DCA TRAINING FEE \$ _____
TOTAL FEE \$ 720

Garden State Electrical
Inspection Services Inc.



For Information Call: _____

Permit No. _____

APPROVAL FOR ELECTRICAL

Date

Inspector

| | | |
|-------------------------------------------|-------|--------------------|
| <input type="checkbox"/> Rough | _____ | _____ |
| <input type="checkbox"/> Service | _____ | _____ |
| <input type="checkbox"/> Other | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| <input checked="" type="checkbox"/> Final | 42684 | <i>[Signature]</i> |

U.C.C. Form F-222A

850131579

HUDSON REGIONAL HEALTH COMMISSION

215 HARRISON AVE., HARRISON, NEW JERSEY 07029
TEL. 201-485-7001 FAX 201-485-1251

Certificate of Registration
HAZARDOUS WASTE GENERATOR

COMPANY NAME: Monsanto Co., Kearny Plant REGISTRATION NO. 070106
ADDRESS: Pennsylvania Ave. CATEGORY: #4
Kearny, N.J. 07032

WASTE TYPES REGISTERED: D001, F005, C377, X726, U147, D002, D011,
P098, P012
ISSUE DATE: 1/1/91 EXPIRATION DATE: 12/31/95

ISSUED BY:

[Signature]
DIRECTOR
[Signature]
PROGRAM COORDINATOR

The above referenced company is duly registered as a hazardous waste generator under the provisions of section 8:1 of the Hazardous Substance Control Code of the Hudson Regional Health Commission. A copy of this certificate shall be made available for inspection at the premises where hazardous waste is generated in accordance with section 8:3 of said code.

This certificate shall not be viewed as a license to transport or generate hazardous waste nor does it void the holder's obligation to comply with any other regulations or permit requirements.

"Serving Bayonne, East Newark, Guttenberg, Harrison, Hoboken, Jersey City, Kearny, North Bergen, Secaucus, Union City, Weehawken, West New York"

HUDSON REGIONAL HEALTH COMMISSION

215 HARRISON AVE., HARRISON, NEW JERSEY 07029

TEL. 201-485-7001 FAX 201-485-1251

Certificate of Registration

REMEDIAL ACTION

Registration No. 1026

Site Name: Monsanto Company

Property Owner: Monsanto Company

Address Pennsylvania Avenue
Kearny, N.J. 07032

Address Pennsylvania Avenue
Kearny, N.J. 07032

Contact Person(s) Connie Barrial

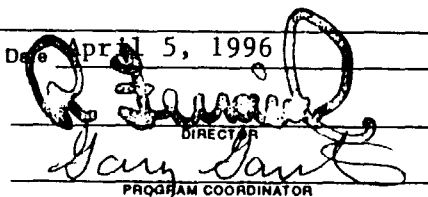
Phone 201-589-0350

Type of Activity Registered extraction of groundwater (dewatering)

Issue Date April 5, 1994

Expiration Date April 5, 1996

Issued by


DIRECTOR
PROGRAM COORDINATOR

Remedial actions at the above referenced site have been registered in accordance with section 7:1 of the Hazardous Substance Control Code of the Hudson Regional Health Commission.

A copy of this certificate shall be maintained at the premises where remedial actions are being conducted in accordance with section 7:3 of said code.

Possession of this certificate shall in no way void the holder's obligation to comply with all applicable regulations or permit requirements.

"Serving Bayonne, East Newark, Guttenberg, Harrison, Hoboken, Jersey City, Kearny, North Bergen, Secaucus, Union City, Weehawken, West New York"

850131582

HUDSON REGIONAL HEALTH COMMISSION

215 HARRISON AVE., HARRISON, NEW JERSEY 07029
TEL. 201-485-7001 FAX 201-485-1251

Certificate of Registration
MONITORING WELLS

Facility Name: Monsanto Company Kearny Plant

Registration No. 155

Address Pennsylvania Avenue
Kearny, N.J. 07032

Location of Wells same

Contact Person Connie Barrial

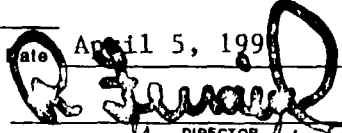
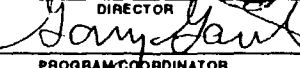
Phone 201-589-0350

Number of Wells Registered 8

Issue Date April 5, 1994

Expiration Date April 5, 1995

Issued by


DIRECTOR

PROGRAM COORDINATOR

This registration certificate satisfies the requirements of section 9:1 of the Hazardous Substance Control of the Hudson Regional Health Commission.

This certificate does not void the holder's obligation to comply with any other regulations or permit requirements.

"Serving Bayonne, East Newark, Guttenberg, Harrison, Hoboken, Jersey City, Kearny, North Bergen, Secaucus, Union City, Weehawken, West New York"

850131583

HUDSON REGIONAL HEALTH COMMISSION

215 HARRISON AVE. HARRISON, NEW JERSEY 07029

TEL 201 485 7001 FAX 201 485 1251

Certificate of Registration

DISCHARGE CLEANUP ORGANIZATION

Company Name: Westinghouse Remediation Services
Address: 255 Business Center Drive
Suite A
Horsham, PA 19044
Telephone: 1-800-544-3012
Registration No: 156
Issued Date: April 5, 1994
Expiration Date: April 5, 1996

Issued by

[Signature]
Program Coordinator

This State-registered company is duly registered as a discharge cleanup organization under the provisions of section 6-1 of the Hazardous Materials and Superfund of the Hudson Regional Health Commission. A copy of this certificate shall be maintained at the site of hazardous waste cleanup operations and in accordance with section 6-3 of said code.

This certificate shall not be viewed as a license to transport hazardous waste nor does it void the holder's obligation to comply with all other regulations and permit requirements.

Hudson Regional Health Commission, Guttenberg, Harrison, Hoboken, Jersey City, Kearny, Linn Bunker, Newark, Union City, Weehawken, West New York

850131584

EMERGENCY/CONTINGENCY PLAN

MONSANTO KEARNY PLANT
Kearny, New Jersey

April 1994

Prepared for:

MONSANTO COMPANY
Pennsylvania Avenue
Kearny, New Jersey 07032

Prepared by:

ROUX ASSOCIATES, INC.
1222 Forest Parkway, Suite 190
West Deptford, New Jersey 08066

850131586

ROUX

EMERGENCY/CONTINGENCY PLAN

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| 2. Arrangements with Local Police, Fire Departments, Hospitals and Emergency Response Services | 2 |
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| 5. Facility Location, Description and Diagram | 5 |
| 6. Physical Characteristics and Capabilities of Safety and Emergency Response Equipment | 6 |
| 7. Topographical and Geographical Maps | 7 |
| 8. Facility Characteristics and Evacuation Routes and Signals | 8 |

QUALITY INFORMATION, DESCRIPTIONS OF WASTE HANDLED, FEDERAL, STATE, AND LOCAL EMERGENCY RESPONSE CONTACTS

Company Monsanto Company
Address 800 North Lindbergh Blvd., St. Louis, MO 63167
Location of Facility Pennsylvania Avenue
City Kearny State New Jersey Zip 07032
Telephone (201) 589-0350 EPA # NJD002444933
Primary Emergency Coordinator Connie Barriol Address Monsanto Company, Pennsylvania Ave., Kearny, NJ 07032
Telephone (Office) (201) 589-0350 (Home) (201) 943-3375
Secondary Emer Coordinator Celso Balan Address Monsanto Company, Pennsylvania Ave., Kearny, NJ 07032
Telephone (Office) (201) 589-0350 (Home) (201) 869-5887
Secondary Emer Coordinator Peter Palco Address Roux Associates, Inc., 1222 Forest Pkwy, #190, W. Deptford, NJ
Telephone (Office) (609) 423-8800 (Home) (609) 764-9712

Description of Waste Handled (PCB-impacted soil)

[illegible]

Federal, State & Local Emergency Response Contacts

Primary Fire Dept. Kearny Fire Department, 109 Midland Avenue, Kearny, NJ 07032 (201) 991-1400 or 911

Secondary Fire Dept. Newark Fire Department, 1 Lincoln Avenue, Newark NJ 07101 (201) 733-3660

Secondary Fire Dept. Jersey City Fire Department, 465 Luis Munoz Marin Blvd., Jersey City, NJ 07303 (201) 547-4248

Emergency Service Kearny Volunteer Emergency Squad, 352 Maple Avenue, Kearny, NJ 07032 (201) 997-7500

Emergency Response Team Hudson Reg. Health Comm., 215 Harrison Avenue, Harrison, NJ 07029 (201) 485-7001

City Police Kearny Police Department, 237 Laurel Avenue, Kearny, NJ 07032 (201) 998-1313 or 911

County Police Hudson County Police Department, 549 Duncan Avenue, Jersey City, NJ 07305 (201) 915-1300

Primary Hospital Jersey City Medical Center 50 Baldwin Avenue, Jersey City, NJ 07304 (201) 915-2000

Secondary Hospital West Hudson Hospital, 206 Bergen Avenue, Kearny, NJ 07032 (201) 955-7000

Secondary Hospital Meadowlands Hospital Medical Center, Meadowlands Parkway, Secaucus, NJ 07094 (201) 392-3100

ATE

at Police Hdqrs. P.O. Box 7068, West Trenton, New Jersey 08628-0068 (609) 882-2000
at Environmental Hdqrs. NJDEPE 401 E. State Street, Trenton, New Jersey 08625 (609) 292-9120
ate Emergency Response NJDEPE 300 Horizon Center, Trenton, New Jersey 08625 (609) 584-4280

D 3AL

Nearest EPA Office Region 2 26 Federal Plaza, New York, New York 10278 (212) 264-2525

US COAST GUARD
NATIONAL RESPONSE CENTER
800-424-8802

CHEMTREC-EMERGENCY
RESPONSE
800-424-9300

POISON CENTER
800-962-1253

ARRANGEMENTS WITH LOCAL POLICE, FIRE DEPARTMENTS, HOSPITALS AND EMERGENCY RESPONSE SERVICES**Arrangements with Local Police**

The Kearny Police Department and Hudson County Police Department have been given a copy of this Emergency/Contingency Plan.

Arrangements with Local Fire Departments

The Kearny Fire Department, Newark Fire Department, and Jersey City Fire Department have been given a copy of this Emergency/Contingency Plan.

Arrangements with Local Hospitals

The Jersey City Medical Center, The West Hudson Hospital, and the Meadowlands Hospital Medical Center have been given a copy of this Emergency/Contingency Plan.

Arrangements with Local or State Emergency Response Services

Hudson Regional Health Commission and NJDEPE Bureau of Emergency Response have been given a copy of this Emergency/Contingency Plan.

Hospital Emergency Information**Hospital Phone Numbers:**

Jersey City Medical Center (201) 915-2000
West Hudson Hospital (201) 955-7000
Meadowlands Hospital Medical Center (201) 392-3100

Hospital Equipment Requirements

No special equipment required

Fire Police Emergency Information**Fire and Police Phone Numbers:**

Kearny Fire Department (201) 991-1400
Newark Fire Department (201) 733-3660
Jersey City Fire Department (201) 547-4248
Kearny Police Department (201) 998-1313
Hudson County Police Department (201) 915-1300

Emergency Equipment and Service Required

No special equipment required

EMERGENCY/CONTINGENCY PLAN

PAGE 3

PRIMARY/SECONDARY (ALTERNATE) EMERGENCY COORDINATOR'S RESPONSIBILITIES/ACTIVITIES

PRIMARY EMERGENCY COORDINATOR (if on duty)

Name Connie Barrial Title Site Project Manager Office Phone (201) 589-0350
Address Monsanto Company, Pennsylvania Ave., Kearny, NJ Home Phone (201) 943-3375

Functions/Activities during Emergency (Describe in detail).

Contact local Emergency Departments (Fire, Police, Ambulance) and give:

- name • location of emergency
 - telephone number • nature of emergency
- then hang on phone until further instructions are given.

Also responsible for notification of State, Federal and Local regulatory agencies in the event of a release of a hazardous substance, if applicable.

- Will contact the local police, fire and other emergency services in the event of an emergency.
- Will be responsible for all arrangements with emergency services.
- Will implement Emergency/Contingency plan.
- Will be responsible for assuring evacuation, emergency treatment, emergency transport of site personnel and notification of emergency response services as well as appropriate management staff.

SECONDARY EMERGENCY COORDINATOR (if on duty)

Name Celso Balan Title Site Representative Office Phone (201) 589-0350
Address Monsanto Company, Pennsylvania Ave., Kearny, NJ Home Phone (201) 869-5887

Function/Activities during Emergency (Describe in detail).

Secondary Emergency Coordinator will act in place of the Primary Emergency Coordinator in the event the Primary is not available.

SECONDARY EMERGENCY COORDINATOR

Name Peter Palko Title Consultant Project Manager Office Phone (609) 423-8800
Address Roux Associates, Inc., 1222 Forest Pkwy., #190, W. Deptford, NJ Home Phone (609) 764-9712

Functions/Activities during Emergency (Describe in detail)

Secondary Emergency Coordinator will act in place of the Primary Emergency Coordinator in the event the Primary is not available.

850131590

JOB DESCRIPTION/EMERGENCY RESPONSIBILITIES

Job Description: Site Health and Safety Officer Name Brian Schug

Emergency Responsibilities/Activities (Describe in Detail)

- Responsible for project compliance with Health and Safety Plan requirements.
- Authorized to stop work in the event of emergency situation or potentially dangerous situation.
- Will contact emergency services when appropriate.

Job Description: Contractor Project Manager Name Gould Hunter

Emergency Responsibilities/Activities (Describe in Detail)

- Overall responsibility for assuring health and safety of all personnel at the site.
- Responsible for implementation of all aspects of the site Health and Safety Plan.
- Responsible for ensuring site activities do not present increased hazards to human health or the environment.
- Will contact emergency services when appropriate.
- May act as Emergency Coordinator if Primary AND Secondary Emergency Coordinator(s) are unavailable.

Job Description: Contractor Project Supervisor Name Dan Welsch

Emergency Responsibilities/Activities (Describe in Detail)

- Responsible for oversight of field activities.
- Responsible for directing field activities in compliance with all aspects of the site Health and Safety Plan.

FACILITY LOCATION, DESCRIPTION AND DIAGRAM

| | |
|----------|-----------------------------------------|
| Facility | Monsanto Company Kearny Plant |
| Location | Pennsylvania Avenue, Kearny, New Jersey |

Facility Description

The site is approximately 26 acres in size and located in a highly industrialized area. It is bordered by the Passaic River on the west, by the Conrail Railyard on the north and trucking distribution facilities on the south and east. There are no residences within a one-mile radius of the site. The site is relatively flat with the exception of the western perimeter of the site which slopes toward the Passaic River. The site was formerly used to manufacture chemicals. In 1992, all production facilities were demolished. Presently, an office building, a warehouse, a guard house and several office trailers are the only buildings on site.

Facility Diagram (Identify location of individual emergency equipment, etc.)

See Attached Figure 1

Legend

- | | |
|-----------------------------------|----------------------------------|
| a. Entrances | i. Guard Gates/Stations |
| b. Emergency Exits | j. Emergency Equipment Locations |
| c. Vehicle Parking Areas | k. Eye Wash Stations |
| d. Spill Control Equipment | l. Fire Extinguisher |
| e. Communication Systems/Speakers | m. Emergency Respirators |
| f. Fire alarm (Evacuation Horn) | n. Monitoring Equipment |
| g. Decontamination Equipment | o. Hazardous Soil Storage Area |
| h. First Aid Stations | |

PHYSICAL CHARACTERISTICS AND CAPABILITIES OF SAFETY AND EMERGENCY RESPONSE EQUIPMENT

Location: The locations of the following safety and emergency response equipment are denoted on Figure 1 (attached).

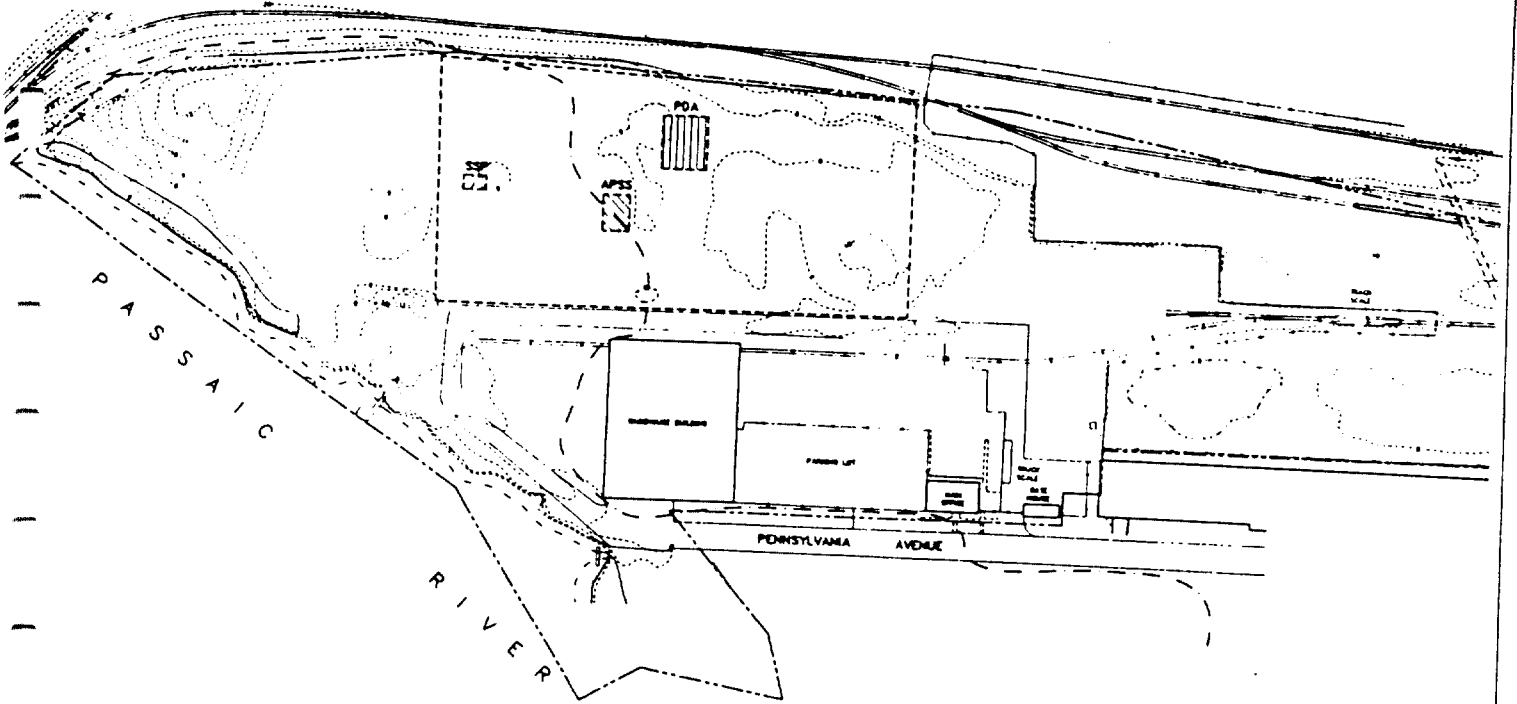
| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>e. Entrances</p> <p>Site entrance is located on Pennsylvania Avenue. Construction/personnel entrances to construction area (Exclusion Zone) are accessed via Hauling Route.</p> | <p>f. Fire Alarm (Evacuation Horn)</p> <p>Air horns are located in the Command Post and Decon Areas. Notification of fire/explosion/release will be made by sounding of a portable air horn for a period of 10 seconds.</p> | <p>k. Eye Wash Stations</p> <p>Eye wash stations are located at Command Post and in active work areas.</p> |
| <p>f. Emergency Exits</p> <p>Site exit is located on Pennsylvania Avenue. Construction/personnel exits from construction area (Exclusion Zone) are accessed via Hauling Route.</p> | <p>g. Decontamination Equipment</p> <p>Equipment decontamination and personnel decontamination are located adjacent to the construction entrance northwest of the existing warehouse.</p> | <p>l. Fire Extinguisher</p> <p>Fire extinguishers are located at the Command Post and in active work areas.</p> |
| <p>g. Vehicle Parking Areas</p> <p>Vehicle parking areas are located on the northeast side of the site.</p> | <p>h. First Aid Stations</p> <p>First aid and eye wash stations are located at the Command Post and the Decon Area.</p> | <p>m. Emergency Respirators</p> <p>Emergency respirators located at Command Post and in active work areas.</p> |
| <p>h. Spill Control Equipment</p> <p>Tools and materials for control of spills are located in the Decon Area.</p> | <p>i. Guard Gate/Stations</p> <p>A Guard Station is located at the site entrance on Pennsylvania Ave.</p> | <p>n. Monitoring Equipment</p> <p>Air monitoring equipment is located in active work areas. Air monitoring equipment is used to monitor for airborne particulates, toxic and flammable gases and oxygen concentration.</p> |
| <p>i. Communication System</p> <p>Communication System (2-way radios and base station) is located in the Command Post.</p> | <p>j. Emergency Equipment Locations</p> <p>Emergency equipment is located in the Command Post and Decon Areas.</p> | <p>o. Hazardous Soil Storage Area</p> <p>A large soil handling area is located centrally to the three areas of concern.</p> |
| | | |
| | | |
| | | |

EMERGENCY/CONTINGENCY PLAN

PAGE 7

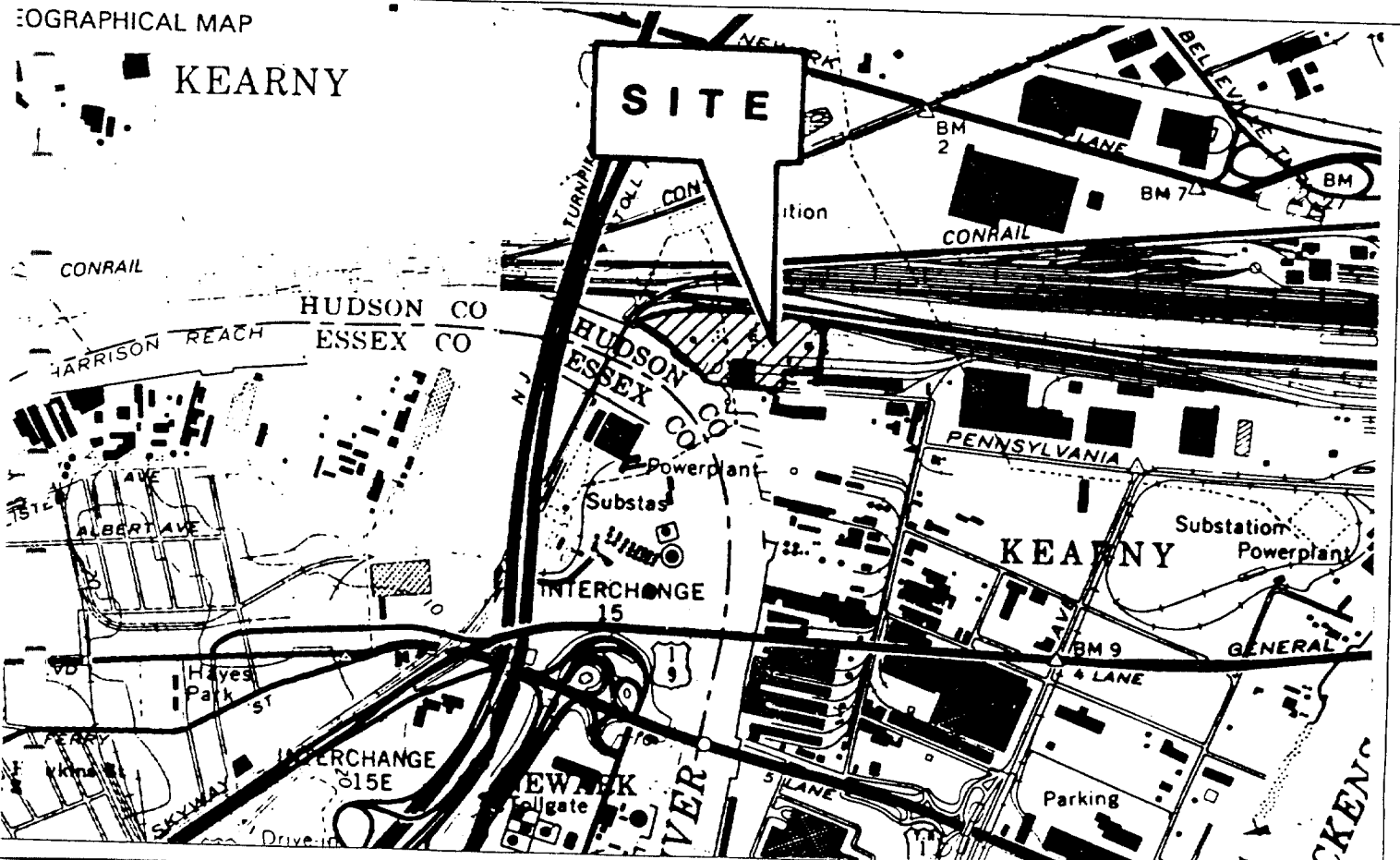
TOPOGRAPHICAL AND GEOGRAPHICAL MAPS

TOPOGRAPHICAL MAP



GEOGRAPHICAL MAP

KEARNY



FACILITY CHARACTERISTICS AND EVACUATION ROUTES AND SIGNALS**COGROGRAPHICAL MAP (Provide a description or information)****Flow of Runoff and Surface Waters:**

The site is primarily flat, however, runoff flows southwest towards the Passaic River.

There are no surface waters on the site. The Passaic River, which is adjacent to the site, flows towards the southeast.

Facility Location and Parameters:

The site is located on Pennsylvania Avenue in Kearny, Hudson County, New Jersey.

Underground Water Systems or Wells:

Presently, there are eight on-site monitoring wells which will be used for ground-water compliance monitoring.

Artificial or Natural Facility Barriers:

The site perimeter is secured with a chain-link fence.

The site is bordered on the southwest by the Passaic River, on the north by the Conrail Railyard, on the south by Pennsylvania Avenue, and on the east by industrial properties.

Authorized Personnel Sign Locations:

All entrances to the site are posted with "Authorized Personnel Only" signs or similar including the main guard gate and various perimeter fencing locations.

COGROGRAPHICAL MAP (Provide a description or information)**Primary Evacuation Routes:**

See Figure 1 - Evacuate to either the Construction or Personnel Exit then to Site Entrance/Exit at Pennsylvania Ave.

Signals to be used for each Evacuation Plan:

Notification of an emergency will be made by sounding of a portable air horn for a period of 10 seconds.

Location and Directions to Primary Hospital Facilities (See Figure 2):**Directions to Primary Hospital**

- From site, take Pennsylvania Avenue east to Jacobus Avenue.
- Turn right onto Jacobus Avenue, continue on Jacobus Avenue to first traffic light.
- Go straight through traffic light, following signs for Routes 1 and 9 north, Jersey City and New York. Go under overpass and bear left.
- Enter Route 1 and 9 (which becomes Communipaw Avenue in Jersey City after crossing the Hackensack River).
- Turn left onto J.F. Kennedy Boulevard.
- Turn right onto Montgomery Street.
- The Jersey City Medical Center is on the right at the intersection of Baldwin Avenue and Montgomery Street, after the intersection.

MONSANTO COMPANY KEARNY PLANT
Remedial Action Implementation
Emergency/Contingency Plan Distribution List

Page 1 of 2

| Recipient | Contact | Phone Number |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------|
| NJDEPE
Division of Responsible Party
Site Remediation
Bureau of State Case Management
CN 028
Trenton, New Jersey 08625-0028 | Glenn Savary
Case Manager | (609) 633-0719 |
| Kearny Fire Department
109 Midland Avenue
Kearny, New Jersey 07032 | Thomas Dunwoodie
Chief Inspector | (201) 991-1400 |
| Kearny Health Department
645 Kearny Avenue
Kearny, New Jersey 07032 | Mike Beard
Chief Sanitarian | (201) 997-0600 |
| Kearny Police Department
237 Laurel Avenue
Kearny, New Jersey 07032 | John Wynne
Deputy Chief | (201) 998-1313 |
| Jersey City Medical Center
50 Baldwin Avenue
Jersey City, New Jersey 07304 | Russel Crookendale
Director of Environmental Services | (201) 915-2067 |
| West Hudson Hospital
206 Bergen Avenue
Kearny, New Jersey 07032 | Darlene Shaw
Safety Officer | (201) 955-7036 |
| Meadowlands Hospital Medical Center
Meadowlands Parkway
Secaucus, New Jersey 07094 | Brenda Hall
Director of Critical Care | (201) 392-3112 |
| Hudson County Regional Health
Commission/Emergency Response
215 Harrison Avenue
Harrison, New Jersey 07029 | Gary Garetano
Assistant Director | (201) 485-7001 |
| Hudson County Department of Public Safety
595 County Avenue
Secaucus, New Jersey 07094 | Bruce Walter
Emergency Management Coordinator | (201) 319-2871 |
| Hudson County Police Department
549 Duncan Avenue
Jersey City, New Jersey 07305 | Gary Hoffman
Deputy Chief | (201) 915-1300 |
| NJDEPE
Bureau of Emergency Response
2 Babcock Place
West Orange, New Jersey 07052 | Gary Allen
Region Chief | (201) 699-3955 |

850131596

MONSANTO COMPANY KEARNY PLANT
Remedial Action Implementation
Emergency/Contingency Plan Distribution List

Page 2 of 2

| Recipient | Contact | Phone Number |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------|
| NJDEPE
Bureau of Field Operations
300 Horizon Center
CN 407
Trenton, New Jersey 08625-0407 | Jerry O'Donnell
Senior Hazardous Site Mitigation Specialist | (609) 584-4280 |

850131597



EcoChem, Inc.

Environmental Science and Chemistry

POST EXCAVATION SOIL ANALYSIS DATA REVIEW
SDGs: 34494, 34856, 35152, AND 35306

Analyzed by:

Enseco - East
2200 Cottontail Lane
Somerset, NJ 08073

Prepared for:

Roux Associates, Inc.
1222 Forest Parkway, Suite 190
West Deptford, NJ 08066

Monsanto Purchase Order No. 6792-59

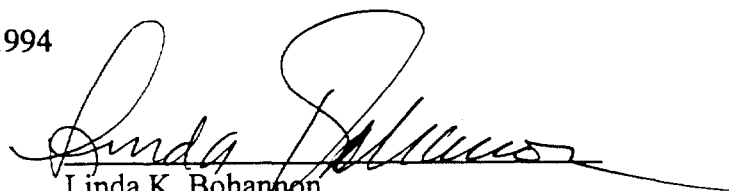
Prepared by:

EcoChem, Inc.
1401 Norton Building
801 Second Avenue
Seattle, Washington 98104

EcoChem Project Number: C6702

July 22, 1994

Approved for Release:


Linda K. Bohannon
Vice President/Project Director
EcoChem, Inc.

850131599

INTRODUCTION

This report summarizes the quality control evaluation and recommended data qualifications for twelve (12) soil samples. The samples were collected during four (4) discrete sampling events occurring on 5/31/94 and 6/2/94 (SDG 34494), 6/9/94 (SDG 34856), 6/28/94 (SDG 35152), and 7/7/94 (SDG 35306). Refer to the Sample Index (Page 1 of the report) for sample identifications.

The samples were analyzed by the following method and reviewed by the following EcoChem chemists:

| Method | Primary | Secondary |
|----------------|---------|--------------|
| PCBs - SW-8080 | Ted Lee | Mark Brindle |

The data quality evaluation was based on the quality control criteria specified in the analytical method and USEPA *National Functional Guidelines for Organic Data Review*, June, 1991.

EcoChem's goal in assigning validation qualifiers is to assist in proper data interpretation. If values are assigned a J or UJ, data can be used for the intended project-specific purposes, but the reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values are not assigned a qualifier, the data meet all data quality goals as outlined in the documents referenced above.

Data qualifier definitions and copies of the qualified data results summaries are included as Appendices A and B, respectively. Appendix C consists of the Data Validation Worksheets and Appendix D contains copies of communication records and laboratory data resubmittals (if applicable).

DATA VALIDATION REPORT
ROUX ASSOCIATES, INC.
PCB ANALYSES
SDG: 34494, 34856, 35152, AND 35306

This report documents the technical data review of twelve sediment samples and five field blank samples analyzed for PCBs. The samples were analyzed by Enseco-East. The samples are numbered:

| Client Sample ID | Lab Sample ID |
|------------------|----------------|
| SSP-1 | 034494-0001 |
| SSP-2 | 034494-0002 |
| FIELD BLANK | 034494-0003 |
| SSP-2a | 034494-0004 |
| FIELD BLANK | 034494-0005-FB |
| APSS-1 | 034856-0001 |
| APSS-2 | 034856-0002 |
| APSS-3 | 034856-0003 |
| FIELD BLANK | 034856-0004-FB |

| Client Sample ID | Lab Sample ID |
|------------------|----------------|
| IPDA-1 | 035152-0001 |
| IPDA-2 | 035152-0002 |
| FIELD BLANK | 035152-0003-FB |
| OPDA-1 | 035306-0001 |
| OPDA-2 | 035306-0002 |
| OPDA-3 | 035306-0003 |
| OPDA-4 | 035306-0004 |
| FIELD BLANK | 035306-0005-FB |

I. Sample Holding Times: ACCEPTABLE/All criteria met.

The recommended extraction holding time criterion for aqueous matrices is seven days from date of collection to date of extraction. The recommended analysis holding time criterion for aqueous matrices is 40 days from date of extraction to date of analysis. The recommended extraction holding time criterion for sediment matrices is 14 days from date of collection to date of extraction. The recommended analysis holding time criterion for sediment matrices is 40 days from date of extraction to date of analysis. The samples were extracted and analyzed within the technical holding time limits.

II. Blank Analyses: ACCEPTABLE/All criteria met.

A method blank was extracted with every batch or every 20 samples, whichever was more frequent. No target compounds were detected in the method blank at or above the method detection limit (MDL).

III. Surrogate Recovery: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

For SDG 34494, Sample SSP-1 was analyzed at a 1000:1 dilution and Sample SSP-2 was analyzed at a 5000:1 dilution. The surrogates were consequently diluted out and are not reported for these samples. No qualifiers are assigned on this basis.

For SDG 34856, the laboratory rounded the sample results to two significant figures prior to the final calculation; thereby, introducing a rounding error into the surrogate calculation. No further action was taken since the result of the rounding error did not adversely affect the data.

For SDG 35306, Sample OPDA-2 was analyzed at a 5:1 dilution. The surrogates were consequently diluted out and are not reported for this sample. No qualifiers are assigned on this basis. The surrogate percent recovery for decachlorobiphenyl (DCBP) at 46% was below the recommended acceptance criteria of 60% to 150% for the field blank sample (lab ID 035306-0005-FB). The surrogate percent recovery for tetrachloro-*m*-xylene (TCMX) for this sample was acceptable. No qualifiers were assigned on this basis.

The surrogate recovery values of TCMX and DCBP were within the laboratory control limits for all other samples.

IV. Matrix Spike/Matrix Spike Duplicate Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

A matrix spike and matrix spike duplicate was extracted and analyzed for every batch or every 20 samples, whichever was more frequent. The laboratory benchsheet for SDG 35152 reported that the MS/MSD analysis was performed on Sample IPDA-2; however, after conferring with the client, it was determined that the laboratory had mislabeled the MS/MSD samples. No PCBs were detected in the samples; therefore, the MS/MSD results were unaffected. The MS/MSD analysis was performed on Sample IPDA-1 for SDG 35152, Samples SSP-2 and SSP-2a for SDG 34494, and Sample APSS-1 for SDG 34856.

The percent recovery values (%R) and relative percent difference values (RPD) for the MS/MSD analysis performed on Sample SSP-2 were outside the laboratory control limits. No qualifiers were assigned on this basis since the amount of PCB present in the sample was greater than four times the spike amount.

The percent recovery values (%R) for Aroclor 1016 for the MS/MSD analysis performed on Sample SSP-2a was outside the laboratory control limits. No qualifiers were assigned on this basis since the amount of Aroclor 1016 was augmented by the presence of Aroclor 1248 indigenous to the sample. The relative percent difference values (RPD) were within acceptable limits.

The percent recovery values (%R) for the MS/MSD analysis performed on Sample APSS-1 were outside the laboratory control limits. No qualifiers were assigned on this basis since amounts of Aroclor 1016 and Aroclor 1260 were augmented by the presence of Aroclor 1248 and Aroclor 1254 indigenous to the sample. The relative percent difference values (RPD) were within acceptable limits.

V. Laboratory Control Sample (LCS) Analyses: ACCEPTABLE/With the following discussion.

Qualified Data: None.

Discussion:

The results for 09JUN94A-DCS2 for SDG 34856 were calculated using a sample amount of 2.0 g; however, the sample amount for this duplicate control standard reported on the benchsheet was 2.1 g. No further action was taken since the results for this control sample, using both sample amounts, were acceptable. All other LCS percent recovery values were reviewed and are acceptable.

VI. Compound Identification: ACCEPTABLE/With the following exceptions.

Qualified Data:

| Analyte | Sample ID | Qualifier | Reported Value (µg/Kg) | Reason |
|--------------|-----------|-----------|------------------------|----------------------------|
| Aroclor 1248 | APSS-1 | J | 13000 | Results may be biased high |
| | APSS-2 | | 14000 | |
| | APSS-3 | | 11000 | |

Discussion:

For SDG 34494, Aroclor 1260 was identified in Sample SSP-1, Aroclor 1254 was identified in Sample SSP-2, and Aroclor 1248 was identified in Sample SSP-2a at concentrations greater than the detection limit required by the method.

For SDG 34856, Aroclor 1248 and Aroclor 1254 were both detected in Samples APSS-1, APSS-2, and APSS-3. The laboratory calculated the amounts of Aroclor 1248 and Aroclor 1254 in the sample and only reported the values for Aroclor 1248, because it yielded the higher concentrations. Since Aroclor 1248 is augmented by the presence of Aroclor 1254, the reported results may be biased high. Qualified data are summarized in the above table.

The total amount of PCBs reported in Samples APSS-1, APSS-2, and APSS-3 may be biased low for the following reasons: The method by which the laboratory only reports the PCB with the higher concentration, Aroclor 1248, assumes that the PCB with the lower concentration, Aroclor 1254, has sufficiently augmented the final PCB amount due to coelution. However, Aroclor 1254 does not completely coelute with Aroclor 1248. Therefore, this method only takes

a portion of Aroclor 1254 into consideration when calculating the total PCB concentration. Since the total amount of PCBs reported do not take the whole portion of Aroclor 1254 into account, the results are biased low. No further action was taken since the total PCB concentration was well below the action level of 100 mg/Kg. After conferring with the laboratory, it was decided that in future instances where PCB coelution occurs, quantitation will involve the entire PCB area. In the example above, the area that is used in the quantitation would start at the beginning of Aroclor 1248 and finish at the end of Aroclor 1254.

For SDG 35152, Aroclor 1248 was identified in Sample IPDA-2 at a concentration less than the detection limit required by the method.

For SDG 35306, Aroclor 1248 was identified in Samples OPDA-1, OPDA-2, OPDA-3, and OPDA-4 at concentrations greater than the detection limit required by the method.

VII. Method Detection Limits (MDL): ACCEPTABLE/All criteria met.

The laboratory used the proper reporting limit for PCB compounds. The laboratory reported the sample results in $\mu\text{g/Kg}$ on a dry weight basis for sediment samples and in $\mu\text{g/L}$ for aqueous samples, as required. The laboratory met the method detection limit of five to eight mg/Kg for all field sediment samples.

VIII. Overall Assessment of Data

On the basis of this evaluation, the laboratory followed the specified method. Accuracy was acceptable based on surrogate spike and LCS recovery values. Precision was acceptable based on the low RPD values between laboratory control sample (LCS) analyses.

The data, as qualified, are acceptable for use.



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Appendix A

DATA VALIDATION QUALIFIERS

DATA VALIDATION QUALIFIER CODES

NATIONAL FUNCTIONAL GUIDELINES

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

| | |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U | The analyte was analyzed for, but was not detected above the reported sample quantitation limit. |
| J | The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. |
| N | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification". |
| NJ | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration. |
| UJ | The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. |
| R | The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. |



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Appendix B

QUALIFIED SAMPLE RESULTS DATA SHEETS

850131607

Client Name: Roux Associates, Inc.
 Client ID: ROAM/00 Matrix: SOIL

PCBs
 Method 8080

| | | 034856-0001-SA
APSS-1 | | 034856-0001-MS
APSS-1/MS | | 034856-0001-SD
APSS-1/MSD | | 034856-0002-SA
APSS-2 | |
|--------------|-------|--------------------------|-----------------|-----------------------------|-----------------|------------------------------|-----------------|--------------------------|-----------------|
| Analyte | Units | Sample Value | Reporting Limit | Sample Value | Reporting Limit | Sample Value | Reporting Limit | Sample Value | Reporting Limit |
| Aroclor 1016 | ug/kg | ND | 1300 | 19000 2 | | 18000 2 | | ND | 1300 |
| Aroclor 1221 | ug/kg | ND | 1300 | | | | | ND | 1300 |
| Aroclor 1232 | ug/kg | ND | 1300 | | | | | ND | 1300 |
| Aroclor 1242 | ug/kg | ND | 1300 | | | | | ND | 1300 |
| Aroclor 1248 | ug/kg | 13000 J 1 | 1300 | | | | | ND | 1300 |
| Aroclor 1254 | ug/kg | ND | 1300 | | | | | 14000 J 1 | 1300 |
| Aroclor 1260 | ug/kg | ND | 1300 | 15000 | | 14000 | | ND | 1300 |

| | | 034856-0003-SA
APSS-3 | | | | | | | |
|--------------|-------|--------------------------|-----------------|--|--|--|--|--|--|
| Analyte | Units | Sample Value | Reporting Limit | | | | | | |
| Aroclor 1016 | ug/kg | ND | 1300 | | | | | | |
| Aroclor 1221 | ug/kg | ND | 1300 | | | | | | |
| Aroclor 1232 | ug/kg | ND | 1300 | | | | | | |
| Aroclor 1242 | ug/kg | ND | 1300 | | | | | | |
| Aroclor 1248 | ug/kg | 11000 J 1 | 1300 | | | | | | |
| Aroclor 1254 | ug/kg | ND | 1300 | | | | | | |
| Aroclor 1260 | ug/kg | ND | 1300 | | | | | | |

TL 7/22/94

- 1 = The chromatographic pattern indicates a mixture of two co-eluting PCB's: Aroclor-1248 and Aroclor-1254. The results are reported as Aroclor-1248, which yields the higher concentration.
- 2 = Area of spiked components (Aroclor-1016 and Aroclor-1260) is augmented by area of Aroclor-1248 and Aroclor-1254 indigenous to the sample.
- ND = Not Detected

850131608

ST BY: 908-469-4250

: 6-10-94 : 13:51 : ENSECO, INCORPORATED-

12062330114: 2/37



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Appendix C

DATA VALIDATION WORKSHEETS

850131609

SW846 METHOD 8080
DATA VALIDATION FORM

PCB ANALYSIS ONLY

Contract No: 6702-01

SDG No: 34494

Reviewer: TL

Sr. Review: MTB

Date: 7/18/94

1.0 Chain of Custody and Laboratory Narrative

Yes No N/A *none*

1.1 Are the Chain of Custody forms present for all samples?

Action: If no, contact the lab for replacement of missing or illegible copies.

Yes No N/A *none*

1.2 Do the Chain of Custody or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?

Action: Use professional judgement to evaluate the effect on the quality of the data.

2.0 Holding Times
[p.26 (F.G.'88)]

Yes No N/A

2.1 Have any PCB extraction holding times, determined from date of collection to date of extraction, been exceeded?

*samples were
under 24 hour TAT.*

Waters = 7 days
Soils = 14 days

Yes No N/A *samples
extracted on day
of receipt and analyzed the
following day*

2.2 Have any PCB analysis holding times, determined from date of extraction to date of analysis, been exceeded?

HOLDING TIME TABLE

[illegible]

Action: If 40 CFR 136 holding times are exceeded, flag all positive results as estimated (J) and sample quantitation limits as estimated (UJ) and document to the effect that the holding times were exceeded.

1.0 If holding times are grossly exceeded, either on the first analysis or upon re-analysis, the reviewer must use professional judgment to determine the reliability of the data and the effect of additional storage on the sample results. The reviewer may determine non-detect data are unusable (R).

2.0 Due to the limited information concerning holding times for soil samples, it is left to the discretion of the data reviewer to apply water holding time criteria to soil samples.

3.0 Instrument Performance [p.27-29 (F.G.'88)]

Yes

No

N/A

3.1 Are one of the concentration levels of the calibration standards at a concentration near, but above the method detection limit?

Action: A low-level standard must be analyzed which demonstrates sufficient instrument sensitivity to meet the required quantitation limits (CRQL). If not, all positive values below the quantitation limit (calculated from the lowest level standard) should be qualified as estimated (J), and likewise, all non-detects should be qualified UJ. Use professional judgement in determining at what concentration level the instrument has the sensitivity to detect and quantify PCB analytes.

Yes

No

N/A

3.2 Do all Aroclor standard retention times fall within the established windows? *1660 checked only because it's the only PCV used.*

Yes

No

N/A

3.3 Is the % difference between the evaluation and each analysis (quantitation and confirmation) surrogate retention time within QC limits?

4.0 Calibration [p.30-32 (F.G.'88)]

4.1 Initial Calibration

4.1.1 Were calibration standards, at a minimum of five concentration levels, analyzed for each of the following PCB?

| | | | |
|------------|----|-----|----------------------|
| <u>Yes</u> | No | N/A | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | N/A | AR1221 |
| <u>Yes</u> | No | N/A | AR1232 |
| <u>Yes</u> | No | N/A | AR1242 |
| <u>Yes</u> | No | N/A | AR1248 |
| <u>Yes</u> | No | N/A | AR1254 |

4.1.2 Is the linearity check RSD of the calibration factors $\leq 20\%$ for each of the following PCB?

quadratic used.

| | | | |
|------------|----|-----|----------------------|
| <u>Yes</u> | No | N/A | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | N/A | AR1221 |
| <u>Yes</u> | No | N/A | AR1232 |
| <u>Yes</u> | No | N/A | AR1242 |
| <u>Yes</u> | No | N/A | AR1248 |
| <u>Yes</u> | No | N/A | AR1254 |

| | | |
|------------|----|-----|
| <u>Yes</u> | No | N/A |
|------------|----|-----|

4.1.3 If the linearity check RSD was $\leq 20\%$, was the average response factor used for quantitation instead of the calibration curve?

4.2 Analytical Sequence

4.2.1 Was the proper analytical sequence followed for each instrument?

| | | |
|------------|----|-----|
| <u>Yes</u> | No | N/A |
|------------|----|-----|

4.2.1.1 Initial Calibration (5 levels min.) prior to sample analysis.

| | | |
|------------|----|-----|
| <u>Yes</u> | No | N/A |
|------------|----|-----|

for 1660 only.

4.2.1.2 Verification of the calibration curve, or the calibration factor, for each working day (analysis of a mid-level standard).

| | | |
|------------|----|-----|
| <u>Yes</u> | No | N/A |
|------------|----|-----|

4.2.1.3 Analysis of up to 10 samples.

Yes

(No)

N/A no closing stat for PCB, DCS1, DCS2.
no CCV for 1254 prior to
1254 in sample 34494-2. 1254 CCV
analyzed after the sample. (should this be qualified)

4.2.1.4 Verification of the calibration curve or the calibration factor after the analysis of each set of 10 samples, and at the close of the analytical sequence.

4.3 Continuing Calibration

Yes

No

N/A

4.3.1 Are the continuing calibration standard response factors within 25% of the initial response factors?

| 25% - 50% D | 50% - 90% D | > 90% D |
|-----------------------|----------------------|----------------------|
| "J" Positive results | "J" Positive results | "J" Positive results |
| No action non-detects | "UJ" non-detects | "R" non-detects |

one CCV > 15% for 1260.

If the %D is negative (-), then because of increased instrument sensitivity, the detection limit is not affected (no qualifiers required for non-detected compounds).

5.0 Blanks

[p.33-34 (F.G.'88)]

Yes

No

N/A

5.1 Frequency of Analysis: for the analysis of PCB, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, medium water, low soil, medium soil), whichever is more frequent? **Note:** Also review project QAPP.

Yes

No

N/A

5.2 Chromatography: Is the chromatographic performance (baseline stability) for each instrument acceptable for PCB? Review the blank raw data-chromatograms, quant reports or data system printouts.

leftover interference from high
rel sample - doesn't appear to have

Action: Use professional judgement to determine the effect on the data.
a significant effect

Yes

(No)

N/A

5.3 Do any method/instrument/reagent blanks have positive results for PCB?

Action: If a PCB is found in the blank but not in the sample(s), no action is taken.

Any PCB detected in the sample and also detected in any associated blank must be qualified when the sample concentration is less than 5 times the blank concentration. Apply qualifiers as described in section 5.4. (The contaminant concentration in these blanks are multiplied

to contamination. Use the largest value from all the associated blanks.

| | | |
|------------------------------------------------------|-------------------------------------------------------------|----------------------------------------|
| CRQL < Sample conc < 5X
blank value | Sample conc < CRQL < 5X
blank value | CRQL < 5X blank value <
Sample conc |
| Flag sample result with a "U";
cross out "B" flag | Reject sample result and report
CRQL; cross out "B" flag | No qualification is needed |

Yes No N/A

5.5 Are there field/rinse/equipment blanks associated with every sample?

Action: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank.

6.0 Surrogate Recovery [p.35 (F.G.'88)]

Yes No N/A

6.1 Are surrogate recovery values reported for all samples and blanks?

Yes No N/A

6.2 Are surrogate recovery values within established control limits for all samples and blanks?

Action: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J", and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewer's professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

SURROGATE RECOVERY VIOLATIONS

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |
| | | | |
| | | | |

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |

Yes ☒ No ☐ N/A

6.3 Are there any transcription/calculation errors between the raw data and the reported surrogate recovery values?

Action: If large errors exist, call the lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

pending. 7/6/04

surrogate

calc. for SSP-2a do not agree, however both results are within the control limits

7.0 Matrix Spike/Matrix Spike Duplicate
[p.36 (F.G.'88)]

☒ Yes ☐ No ☒ N/A

7.1 Are the MS/MSD recovery values and resulting RPD values summarized? *not for 34494-4 sample. Results are acceptable though*

7.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

☒ Yes ☐ No ☒ N/A

a. Water DCS-1, DCS-2

☒ Yes ☐ No ☒ N/A

b. Soil

Action: If any of the matrix spike data are missing, call the lab for explanation/resubmittal.

☒ Yes ☐ No ☒ N/A

7.3 Are any PCB spike recovery values outside QA limits?

34494-2 had conc of 1254 > 4x spike amount. unable to see 1660 spike. No qualifiers used.

no MS/MSD data for 34494-4 Raw data received 6/1/94

MS/MSD RECOVERY VALUE VIOLATIONS

due to presence of 1248 in the sample. No qualifiers used.

| Sample ID | Matrix | Compound | MS % Rec | MSD % Rec |
|-----------|--------|----------|----------|-----------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

Yes No N/A

7.4 Are any RPDs for matrix spike and matrix spike duplicate recovery values outside of QC limits?

no MS/MSD info for 1248.

MS/MSD RECOVERY VALUE RPD VIOLATIONS

| Sample ID | Matrix | Compound | RPD |
|-----------|--------|----------|-----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Action: If MS and MSD both have less than 10% recovery for a PCB, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for the MS/MSD analysis. Use professional judgement in applying this criterion to other samples in the package.

Yes No N/A

7.5 Are there any transcription/calculation errors between the raw data and the reported MS/MSD recovery and RPD values?

Action: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

8.0 Field Duplicates
[p.36 (F.G.'88)]

Yes No N/A

8.1 Were any field duplicates submitted for PCB analysis?

Action: Use the table on the next page to summarize data values and calculate values of relative percent difference.

FIELD DUPLICATE SUMMARY

[illegible]

| Compound | Value #1 | Value #2 | Relative % Difference |
|----------|----------|----------|-----------------------|
| | | | |

Action: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

9.0 Compound Identification
[pp.37-38 (F.G.'88)]

~~Yes~~ No N/A

9.1 For both the quantitation and confirmation column, were the retention times of the major component peaks within the retention time windows?

Yes No N/A

9.2 Are the relative peak height ratios of the major component peaks the same between the chromatographic patterns of the sample and the associated standard?

Action: If PCBs exhibit marginal pattern-matching quality, professional judgement should be used to establish whether the differences are attributable to environmental "weathering". If the presence of a PCB is strongly suggested, results should be reported as presumptively present (N).

If an observed pattern closely matches more than one Aroclor, professional judgment should be used to decide whether the neighboring Aroclor is a better match, or if multiple Aroclors are present.

Yes No N/A

9.0 Were any false negatives reported?

10.0 Compound Quantitation and Reported Detection Limits
[p.38 (F.G.'88)]

Yes No N/A

10.1 Are there any transcription/calculation errors in the sample results summary pages?

Note: PCB results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values

should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.

Yes No N/A

10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

Action: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in narrative.

Action: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the data summary form, and substitute it with data from the analysis of the diluted sample. Specify which data summary page is to be used, then draw a red "X" across the entire page of all of the other data summary pages for that sample that should not be used.

Yes No N/A

10.3 Does any soil sample contain more than 50% moisture?

Action: All data should be flagged as estimated.

11.0 Chromatogram Quality

Yes No N/A

11.1 Were the baselines stable? — *some baseline rise at the end of run due to high level sample injected into*

Yes No N/A

11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? *instrument. CCV's were OK, indicating*

Yes No N/A

11.3 Are early eluting PCBs sufficiently resolved for pattern identification? *that the GC was functioning properly.*

SW846 METHOD 8080
DATA VALIDATION FORM

PCB ANALYSIS ONLY

Contract No: 6702-1

SDG No: 34856

Reviewer: TL 6/10/94

Sr. Review: MTB

Date: 7-8-94

Semi - Cursory.

1.0 Chain of Custody and Laboratory Narrative

Yes ☒ No N/A

1.1 Are the Chain of Custody forms present for all samples?

Action: If no, contact the lab for replacement of missing or illegible copies.

Yes ☒ No N/A

1.2 Do the Chain of Custody or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?

Action: Use professional judgement to evaluate the effect on the quality of the data.

2.0 Holding Times
[p.26 (F.G.'88)]

Yes ☒ No N/A

2.1 Have any PCB extraction holding times, determined from date of collection to date of extraction, been exceeded?

Waters = 7 days

Soils = 14 days

Yes ☒ No N/A

2.2 Have any PCB analysis holding times, determined from date of extraction to date of analysis, been exceeded?

should have been.

*24 TAT samples - all extracted 6/9/94. Samples collected 6/8/94.
Extracts analyzed 6/10/94.*

HOLDING TIME TABLE

[illegible]

Action: If 40 CFR 136 holding times are exceeded, flag all positive results as estimated (J) and sample quantitation limits as estimated (UJ) and document to the effect that the holding times were exceeded.

1.0 If holding times are grossly exceeded, either on the first analysis or upon re-analysis, the reviewer must use professional judgment to determine the reliability of the data and the effect of additional storage on the sample results. The reviewer may determine non-detect data are unusable (R).

2.0 Due to the limited information concerning holding times for soil samples, it is left to the discretion of the data reviewer to apply water holding time criteria to soil samples.

3.0 Instrument Performance
[p.27-29 (F.G.'88)]

Yes

No

N/A

3.1 Are one of the concentration levels of the calibration standards at a concentration near, but above the method detection limit?

Action: A low-level standard must be analyzed which demonstrates sufficient instrument sensitivity to meet the required quantitation limits (CRQL). If not, all positive values below the quantitation limit (calculated from the lowest level standard) should be qualified as estimated (J), and likewise, all non-detects should be qualified UJ. Use professional judgement in determining at what concentration level the instrument has the sensitivity to detect and quantify PCB analytes.

Yes

No

N/A

3.2 Do all Aroclor standard retention times fall within the established windows?

Yes

No

N/A

3.3 Is the % difference between the evaluation and each analysis (quantitation and confirmation) surrogate retention time within QC limits?

4.0 Calibration
[p.30-32 (F.G.'88)]

4.1 Initial Calibration

4.1.1 Were calibration standards, at a minimum of five concentration levels, analyzed for each of the following PCB?

| | | | |
|------------|----|-------|----------------------|
| <u>Yes</u> | No | (N/A) | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | (N/A) | AR1221 |
| <u>Yes</u> | No | (N/A) | AR1232 |
| <u>Yes</u> | No | (N/A) | AR1242 |
| <u>Yes</u> | No | (N/A) | AR1248 |
| <u>Yes</u> | No | (N/A) | AR1254 |

4.1.2 Is the linearity check RSD of the calibration factors $\leq 20\%$ for each of the following PCB?

| | | | |
|------------|----|-------|----------------------|
| <u>Yes</u> | No | (N/A) | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | (N/A) | AR1221 |
| <u>Yes</u> | No | (N/A) | AR1232 |
| <u>Yes</u> | No | (N/A) | AR1242 |
| <u>Yes</u> | No | (N/A) | AR1248 |
| <u>Yes</u> | No | (N/A) | AR1254 |

| | | | |
|-----|----|-------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Yes | No | (N/A) | 4.1.3 If the linearity check RSD was $\leq 20\%$, was the average response factor used for quantitation instead of the calibration curve? |
|-----|----|-------|--------------------------------------------------------------------------------------------------------------------------------------------|

4.2 Analytical Sequence

4.2.1 Was the proper analytical sequence followed for each instrument?

| | | | |
|------------|----|-------|------------------------------------------------------------------------------------------------------------------------------------|
| <u>Yes</u> | No | (N/A) | 4.2.1.1 Initial Calibration (5 levels min.) prior to sample analysis. |
| <u>Yes</u> | No | (N/A) | 4.2.1.2 Verification of the calibration curve, or the calibration factor, for each working day (analysis of a mid-level standard). |
| <u>Yes</u> | No | (N/A) | 4.2.1.3 Analysis of up to 10 samples. |

Yes

No

N/A

4.2.1.4 Verification of the calibration curve or the calibration factor after the analysis of each set of 10 samples, and at the close of the analytical sequence.

4.3 Continuing Calibration

Yes

No

N/A

4.3.1 Are the continuing calibration standard response factors within 25% of the initial response factors?

| 25% - 50% D | 50% - 90% D | > 90% D |
|-----------------------|----------------------|----------------------|
| "J" Positive results | "J" Positive results | "J" Positive results |
| No action non-detects | "UJ" non-detects | "R" non-detects |

If the %D is negative (-), then because of increased instrument sensitivity, the detection limit is not affected (no qualifiers required for non-detected compounds).

5.0 Blanks [p.33-34 (F.G.'88)]

Yes

No

N/A

5.1 Frequency of Analysis: for the analysis of PCB, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, medium water, low soil, medium soil), whichever is more frequent? **Note:** Also review project QAPP.

Yes

No

N/A

5.2 Chromatography: Is the chromatographic performance (baseline stability) for each instrument acceptable for PCB? Review the blank raw data-chromatograms, quant reports or data system printouts.

Action: Use professional judgement to determine the effect on the data.

Yes

No

N/A

5.3 Do any method/instrument/reagent blanks have positive results for PCB?

Action: If a PCB is found in the blank but not in the sample(s), no action is taken.

Any PCB detected in the sample and also detected in any associated blank must be qualified when the sample concentration is less than 5 times the blank concentration. Apply qualifiers as described in section 5.4. (The contaminant concentration in these blanks are multiplied

METHOD/INSTRUMENT/REAGENT BLANK ANALYSIS RESULTS

[illegible]

No

N/A

~~12 7/16/94
no birds
no blanks present~~

Action: Follow the directions in the table below to qualify PCB results due

to contamination. Use the largest value from all the associated blanks.

| | | |
|---------------------------------------------------|----------------------------------------------------------|-------------------------------------|
| CRQL < Sample conc < 5X blank value | Sample conc < CRQL < 5X blank value | CRQL < 5X blank value < Sample conc |
| Flag sample result with a "U"; cross out "B" flag | Reject sample result and report CRQL; cross out "B" flag | No qualification is needed |

Yes

No

~~N/A~~

n=20/4

5.5 Are there field/rinse/equipment blanks associated with every sample?

Action: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank.

6.0 Surrogate Recovery
[p.35 (F.G.'88)]

Yes

No

N/A

6.1 Are surrogate recovery values reported for all samples and blanks?

Yes

No

N/A

6.2 Are surrogate recovery values within established control limits for all samples and blanks?

Action: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J", and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewer's professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

Surrogate control limits not available. All surrogate values are within a 50-125% control limit.

SURROGATE RECOVERY VIOLATIONS

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |
| | | | |
| | | | |

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |

Yes ☒ No ☐ N/A

6.3 Are there any transcription/calculation errors between the raw data and the reported surrogate recovery values?

Action: If large errors exist, call the lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

laboratory entered
DCS-2 amt at

1 g instead of 2.0 g, however the results would be acceptable. No further action taken. Lab also noted sample amt to one decimal point (2 sig figs). Values changed slightly but not significantly. No further action taken.

7.0 Matrix Spike/Matrix Spike Duplicate
[p.36 (F.G.'88)]

Yes ☒ No ☐ N/A

7.1 Are the MS/MSD recovery values and resulting RPD values summarized?

MS/MSD
values reported

YES

7.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

Yes

No

N/A

a. Water

Yes

No

N/A

b. Soil

Action: If any of the matrix spike data are missing, call the lab for explanation/resubmittal.

Yes

No

N/A

7.3 Are any PCB spike recovery values outside QA limits?

No recoveries were high for both 1016 & 1260 (>125%) due to presence of 1248 & 1254 in the sample raising the area results. No further action taken. BSB/BSO were acceptable.

MS/MSD RECOVERY VALUE VIOLATIONS

| Sample ID | Matrix | Compound | MS %
Rec | MSD %
Rec |
|-----------|--------|----------|-------------|--------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

Yes No N/A

7.4 Are any RPDs for matrix spike and matrix spike duplicate recovery values outside of QC limits?

MS/MSD RECOVERY VALUE RPD VIOLATIONS

| Sample ID | Matrix | Compound | RPD |
|-----------|--------|----------|-----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Action: If MS and MSD both have less than 10% recovery for a PCB, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for the MS/MSD analysis. Use professional judgement in applying this criterion to other samples in the package.

Yes No N/A

7.5 Are there any transcription/calculation errors between the raw data and the reported MS/MSD recovery and RPD values?

Action: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

8.0 Field Duplicates
[p.36 (F.G.'88)]

Yes No N/A

8.1 Were any field duplicates submitted for PCB analysis?

Action: Use the table on the next page to summarize data values and calculate values of relative percent difference.

unable to determine
~~if~~ if field dupes
were presented.

FIELD DUPLICATE SUMMARY

[illegible]

| Compound | Value #1 | Value #2 | Relative % Difference |
|----------|----------|----------|-----------------------|
| | | | |

Action: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

9.0 Compound Identification
[pp.37-38 (F.G.'88)]

Yes No N/A

9.1 For both the quantitation and confirmation column, were the retention times of the major component peaks within the retention time windows?

Yes No N/A

9.2 Are the relative peak height ratios of the major component peaks the same between the chromatographic patterns of the sample and the associated standard?

Action: If PCBs exhibit marginal pattern-matching quality, professional judgement should be used to establish whether the differences are attributable to environmental "weathering". If the presence of a PCB is strongly suggested, results should be reported as presumptively present (N).

If an observed pattern closely matches more than one Aroclor, professional judgment should be used to decide whether the neighboring Aroclor is a better match, or if multiple Aroclors are present.

Yes No N/A

9.0 Were any false negatives reported?

1248 & 1254 present. Enisco only quant. and reports the higher value (in this case, 1248). 1254 is therefore reported as ND, however 1248 is flagged, stating that 1254 is present in the sample.

10.0 Compound Quantitation and Reported Detection Limits
[p.38 (F.G.'88)]

Yes No N/A

10.1 Are there any transcription/calculation errors in the sample results summary pages?

Note: PCB results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values

should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.

Yes No N/A

10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

Action: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in narrative.

Action: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the data summary form, and substitute it with data from the analysis of the diluted sample. Specify which data summary page is to be used, then draw a red "X" across the entire page of all of the other data summary pages for that sample that should not be used.

Yes No N/A

10.3 Does any soil sample contain more than 50% moisture?

Action: All data should be flagged as estimated.

11.0 Chromatogram Quality

Yes No N/A

11.1 Were the baselines stable?

Yes No N/A

11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?

Yes No N/A

11.3 Are early eluting PCBs sufficiently resolved for pattern identification?

SW846 METHOD 8080
DATA VALIDATION FORM

PCB ANALYSIS ONLY

Contract No: 6702-1

SDG No: 3552

Reviewer: 6/29/94

Sr. Review: MTB

Date: 6/29/94

curson

1.0 Chain of Custody and Laboratory Narrative

Yes No N/A

1.1 Are the Chain of Custody forms present for all samples?

Action: If no, contact the lab for replacement of missing or illegible copies.

Yes No N/A

1.2 Do the Chain of Custody or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?

Action: Use professional judgement to evaluate the effect on the quality of the data.

2.0 Holding Times
[p.26 (F.G.'88)]

Yes No N/A

2.1 Have any PCB extraction holding times, determined from date of collection to date of extraction, been exceeded?

Waters = 7 days
Soils = 14 days

Yes No N/A

2.2 Have any PCB analysis holding times, determined from date of extraction to date of analysis, been exceeded?

24 hr TAT samples. Samples were extracted & analyzed within 24 hours from sampling.

HOLDING TIME TABLE

[illegible]

Action: If 40 CFR 136 holding times are exceeded, flag all positive results as estimated (J) and sample quantitation limits as estimated (UJ) and document to the effect that the holding times were exceeded.

1.0 If holding times are grossly exceeded, either on the first analysis or upon re-analysis, the reviewer must use professional judgment to determine the reliability of the data and the effect of additional storage on the sample results. The reviewer may determine non-detect data are unusable (R).

2.0 Due to the limited information concerning holding times for soil samples, it is left to the discretion of the data reviewer to apply water holding time criteria to soil samples.

3.0 Instrument Performance
[p.27-29 (F.G.'88)]

Anthony

Yes

No

(N/A)

3.1 Are one of the concentration levels of the calibration standards at a concentration near, but above the method detection limit?

Action: A low-level standard must be analyzed which demonstrates sufficient instrument sensitivity to meet the required quantitation limits (CRQL). If not, all positive values below the quantitation limit (calculated from the lowest level standard) should be qualified as estimated (J), and likewise, all non-detects should be qualified UJ. Use professional judgement in determining at what concentration level the instrument has the sensitivity to detect and quantify PCB analytes.

Yes

No

(N/A)

3.2 Do all Aroclor standard retention times fall within the established windows?

Yes

No

(N/A)

3.3 Is the % difference between the evaluation and each analysis (quantitation and confirmation) surrogate retention time within QC limits?

4.0 Calibration
[p.30-32 (F.G.'88)]

4.1 Initial Calibration

4.1.1 Were calibration standards, at a minimum of five concentration levels, analyzed for each of the following PCB?

| | | | |
|------------|----|------------|----------------------|
| <u>Yes</u> | No | <u>N/A</u> | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | <u>N/A</u> | AR1221 |
| <u>Yes</u> | No | <u>N/A</u> | AR1232 |
| <u>Yes</u> | No | <u>N/A</u> | AR1242 |
| <u>Yes</u> | No | <u>N/A</u> | AR1248 |
| <u>Yes</u> | No | <u>N/A</u> | AR1254 |

4.1.2 Is the linearity check RSD of the calibration factors $\leq 20\%$ for each of the following PCB?

| | | | |
|------------|----|------------|----------------------|
| <u>Yes</u> | No | <u>N/A</u> | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | <u>N/A</u> | AR1221 |
| <u>Yes</u> | No | <u>N/A</u> | AR1232 |
| <u>Yes</u> | No | <u>N/A</u> | AR1242 |
| <u>Yes</u> | No | <u>N/A</u> | AR1248 |
| <u>Yes</u> | No | <u>N/A</u> | AR1254 |

| | | | |
|------------|----|------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Yes</u> | No | <u>N/A</u> | 4.1.3 If the linearity check RSD was $\leq 20\%$, was the average response factor used for quantitation instead of the calibration curve? |
|------------|----|------------|--------------------------------------------------------------------------------------------------------------------------------------------|

4.2 Analytical Sequence

4.2.1 Was the proper analytical sequence followed for each instrument?

| | | | |
|------------|----|------------|------------------------------------------------------------------------------------------------------------------------------------|
| <u>Yes</u> | No | <u>N/A</u> | 4.2.1.1 Initial Calibration (5 levels min.) prior to sample analysis. |
| <u>Yes</u> | No | N/A | 4.2.1.2 Verification of the calibration curve, or the calibration factor, for each working day (analysis of a mid-level standard). |
| <u>Yes</u> | No | N/A | 4.2.1.3 Analysis of up to 10 samples. |

Yes No N/A

4.2.1.4 Verification of the calibration curve or the calibration factor after the analysis of each set of 10 samples, and at the close of the analytical sequence.

4.3 Continuing Calibration

20 D summary sheet for standards provided.

Yes No N/A

4.3.1 Are the continuing calibration standard response factors within 25% of the initial response factors?

| 25% - 50% D | 50% - 90% D | > 90% D |
|-----------------------|----------------------|----------------------|
| "J" Positive results | "J" Positive results | "J" Positive results |
| No action non-detects | "UJ" non-detects | "R" non-detects |

If the %D is negative (-), then because of increased instrument sensitivity, the detection limit is not affected (no qualifiers required for non-detected compounds).

5.0 Blanks
[p.33-34 (F.G.'88)]

Yes No N/A

5.1 Frequency of Analysis: for the analysis of PCB, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, medium water, low soil, medium soil), whichever is more frequent? Note: Also review project QAPP.

Yes No N/A

5.2 Chromatography: Is the chromatographic performance (baseline stability) for each instrument acceptable for PCB? Review the blank raw data-chromatograms, quant reports or data system printouts.

Action: Use professional judgement to determine the effect on the data.

Yes No N/A

5.3 Do any method/instrument/reagent blanks have positive results for PCB?

Action: If a PCB is found in the blank but not in the sample(s), no action is taken.

Any PCB detected in the sample and also detected in any associated blank must be qualified when the sample concentration is less than 5 times the blank concentration. Apply qualifiers as described in section 5.4. (The contaminant concentration in these blanks are multiplied

by the sample dilution factor.)

METHOD/INSTRUMENT/REAGENT BLANK ANALYSIS RESULTS

| Blank ID | Compound | CRQL | Blank Concentration | 5X Action Level | Samples Affected | Q'fier |
|----------|----------|------|---------------------|-----------------|------------------|--------|
| | | | | | | |
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Yes

No

~~N/A~~

5.4 Do any field/rinse blanks have positive PCB results?

Note: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate or calibration QC problems.

Action: Follow the directions in the table below to qualify PCB results due

to contamination. Use the largest value from all the associated blanks.

| | | |
|---------------------------------------------------|----------------------------------------------------------|-------------------------------------|
| CRQL < Sample conc < 5X blank value | Sample conc < CRQL < 5X blank value | CRQL < 5X blank value < Sample conc |
| Flag sample result with a "U"; cross out "B" flag | Reject sample result and report CRQL; cross out "B" flag | No qualification is needed |

Yes

No

~~N/A~~

12/2/84

5.5 Are there field/rinse/equipment blanks associated with every sample?

Action: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank.

6.0 Surrogate Recovery
[p.35 (F.G.'88)]

Yes

No

N/A

6.1 Are surrogate recovery values reported for all samples and blanks?

Yes

No

N/A

6.2 Are surrogate recovery values, within established control limits for all samples and blanks?

all surrogate recoveries
were within 50-125
range.

Action: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J", and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewer's professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

SURROGATE RECOVERY VIOLATIONS

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |
| | | | |
| | | | |

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |

Yes ☒ No N/A

6.3 Are there any transcription/calculation errors between the raw data and the reported surrogate recovery values?

Action: If large errors exist, call the lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

7.0 Matrix Spike/Matrix Spike Duplicate
[p.36 (F.G.'88)]

7.1 Are the MS/MSD recovery values and resulting RPD values summarized?

7.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Water

b. Soil

Action: If any of the matrix spike data are missing, call the lab for explanation/resubmittal.

Yes ☒ No N/A

7.3 Are any PCB spike recovery values outside QA limits?

all within 50-125 range

MS/MSD RECOVERY VALUE VIOLATIONS

| Sample ID | Matrix | Compound | MS %
Rec | MSD %
Rec |
|-----------|--------|----------|-------------|--------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

Yes No N/A

7.4 Are any RPDs for matrix spike and matrix spike duplicate recovery values outside of QC limits?

RPD = 1.67 % , 1.23 % for 1016, 1660 respectively

MS/MSD RECOVERY VALUE RPD VIOLATIONS

| Sample ID | Matrix | Compound | RPD |
|-----------|--------|----------|-----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Action: If MS and MSD both have less than 10% recovery for a PCB, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for the MS/MSD analysis. Use professional judgement in applying this criterion to other samples in the package.

Yes No N/A

7.5 Are there any transcription/calculation errors between the raw data and the reported MS/MSD recovery and RPD values?

Action: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

8.0 Field Duplicates [p.36 (F.G.'88)]

Yes No N/A

8.1 Were any field duplicates submitted for PCB analysis?

Action: Use the table on the next page to summarize data values and calculate values of relative percent difference.

FIELD DUPLICATE SUMMARY

[illegible]

| Compound | Value #1 | Value #2 | Relative % Difference |
|----------|----------|----------|-----------------------|
| | | | |

Action: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

9.0 Compound Identification
[pp.37-38 (F.G.'88)]

cursony.

Yes

No

N/A

9.1

For both the quantitation and confirmation column, were the retention times of the major component peaks within the retention time windows?

Yes

No

N/A

9.2

Are the relative peak height ratios of the major component peaks the same between the chromatographic patterns of the sample and the associated standard?

Action: If PCBs exhibit marginal pattern-matching quality, professional judgement should be used to establish whether the differences are attributable to environmental "weathering". If the presence of a PCB is strongly suggested, results should be reported as presumptively present (N).

If an observed pattern closely matches more than one Aroclor, professional judgment should be used to decide whether the neighboring Aroclor is a better match, or if multiple Aroclors are present.

Yes

No

N/A

9.0

Were any false negatives reported?

10.0 Compound Quantitation and Reported Detection Limits
[p.38 (F.G.'88)]

Yes

No

N/A

10.1

Are there any transcription/calculation errors in the sample results summary pages?

based raw data. Summary sheets not present.

Note: PCB results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values

should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.

Yes No N/A

10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

No summary sheets not present.

Action: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in narrative.

Samples are listed as ND to detect.

Action: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the data summary form, and substitute it with data from the analysis of the diluted sample. Specify which data summary page is to be used, then draw a red "X" across the entire page of all of the other data summary pages for that sample that should not be used.

Yes No N/A

10.3 Does any soil sample contain more than 50% moisture?

Action: All data should be flagged as estimated.

11.0 Chromatogram Quality

Yes No N/A

11.1 Were the baselines stable?

Yes No N/A

11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?

Yes No N/A

11.3 Are early eluting PCBs sufficiently resolved for pattern identification?

ansory.

(copy) SW846 METHOD 8080
DATA VALIDATION FORM

PCB ANALYSIS ONLY

Contract No: 6702-1

SDG No: 35306

Reviewer: R 7/1/94

Sr. Review: MTB

Date: 7-8-94

1.0 Chain of Custody and Laboratory Narrative

Yes No N/A

1.1 Are the Chain of Custody forms present for all samples?

Action: If no, contact the lab for replacement of missing or illegible copies.

Yes No N/A

1.2 Do the Chain of Custody or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data?

Action: Use professional judgement to evaluate the effect on the quality of the data.

2.0 Holding Times
[p.26 (F.G.'88)]

Yes No N/A 24 hr

2.1 Have any PCB extraction holding times, determined from date of collection to date of extraction, been exceeded?

Waters = 7 days
Soils = 14 days

Yes No N/A

24 hours

2.2 Have any PCB analysis holding times, determined from date of extraction to date of analysis, been exceeded?

HOLDING TIME TABLE

[illegible]

12-8-94

Action: If 40 CFR 136 holding times are exceeded, flag all positive results as estimated (J) and sample quantitation limits as estimated (UJ) and document to the effect that the holding times were exceeded.

1.0 If holding times are grossly exceeded, either on the first analysis or upon re-analysis, the reviewer must use professional judgment to determine the reliability of the data and the effect of additional storage on the sample results. The reviewer may determine non-detect data are unusable (R).

2.0 Due to the limited information concerning holding times for soil samples, it is left to the discretion of the data reviewer to apply water holding time criteria to soil samples.

3.0 Instrument Performance
[p.27-29 (F.G.'88)]

Yes No

N/A

3.1 Are one of the concentration levels of the calibration standards at a concentration near, but above the method detection limit?

Action: A low-level standard must be analyzed which demonstrates sufficient instrument sensitivity to meet the required quantitation limits (CRQL). If not, all positive values below the quantitation limit (calculated from the lowest level standard) should be qualified as estimated (J), and likewise, all non-detects should be qualified UJ. Use professional judgement in determining at what concentration level the instrument has the sensitivity to detect and quantify PCB analytes.

Yes No

N/A

3.2 Do all Aroclor standard retention times fall within the established windows?

Yes No

N/A

3.3 Is the % difference between the evaluation and each analysis (quantitation and confirmation) surrogate retention time within QC limits?

4.0 Calibration
[p.30-32 (F.G.'88)]

4.1 Initial Calibration

4.1.1 Were calibration standards, at a minimum of five concentration levels, analyzed for each of the following PCB?

| | | | |
|------------|----|-----|----------------------|
| <u>Yes</u> | No | N/A | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | N/A | AR1221 |
| <u>Yes</u> | No | N/A | AR1232 |
| <u>Yes</u> | No | N/A | AR1242 |
| <u>Yes</u> | No | N/A | AR1248 |
| <u>Yes</u> | No | N/A | AR1254 |

4.1.2 Is the linearity check RSD of the calibration factors $\leq 20\%$ for each of the following PCB?

| | | | |
|------------|----|-----|----------------------|
| <u>Yes</u> | No | N/A | AR1016/1260 (AR1660) |
| <u>Yes</u> | No | N/A | AR1221 |
| <u>Yes</u> | No | N/A | AR1232 |
| <u>Yes</u> | No | N/A | AR1242 |
| <u>Yes</u> | No | N/A | AR1248 |
| <u>Yes</u> | No | N/A | AR1254 |

| | | |
|-----|----|-----|
| Yes | No | N/A |
|-----|----|-----|

4.1.3 If the linearity check RSD was $\leq 20\%$, was the average response factor used for quantitation instead of the calibration curve?

4.2 Analytical Sequence

4.2.1 Was the proper analytical sequence followed for each instrument?

| | | | |
|------------|----|-----|------------------------------------------------------------------------------------------------------------------------------------|
| <u>Yes</u> | No | N/A | 4.2.1.1 Initial Calibration (5 levels min.) prior to sample analysis. |
| <u>Yes</u> | No | N/A | 4.2.1.2 Verification of the calibration curve, or the calibration factor, for each working day (analysis of a mid-level standard). |
| <u>Yes</u> | No | N/A | 4.2.1.3 Analysis of up to 10 samples. |

Yes

No

N/A

4.2.1.4 Verification of the calibration curve or the calibration factor after the analysis of each set of 10 samples, and at the close of the analytical sequence.

4.3 Continuing Calibration

Yes

No

N/A

4.3.1 Are the continuing calibration standard response factors within 25% of the initial response factors?

| 25% - 50% D | 50% - 90% D | > 90% D |
|-----------------------|----------------------|----------------------|
| "J" Positive results | "J" Positive results | "J" Positive results |
| No action non-detects | "UJ" non-detects | "R" non-detects |

If the %D is negative (-), then because of increased instrument sensitivity, the detection limit is not affected (no qualifiers required for non-detected compounds).

5.0 Blanks [p.33-34 (F.G.'88)]

Yes

No

N/A

5.1 Frequency of Analysis: for the analysis of PCB, has a reagent/method blank been analyzed for each set of samples or every 20 samples of similar matrix (low water, medium water, low soil, medium soil), whichever is more frequent? Note: Also review project QAPP.

Yes

No

N/A

5.2 Chromatography: Is the chromatographic performance (baseline stability) for each instrument acceptable for PCB? Review the blank raw data-chromatograms, quant reports or data system printouts.

Action: Use professional judgement to determine the effect on the data.

Yes

No

N/A

5.3 Do any method/instrument/reagent blanks have positive results for PCB?

Action: If a PCB is found in the blank but not in the sample(s), no action is taken.

Any PCB detected in the sample and also detected in any associated blank must be qualified when the sample concentration is less than 5 times the blank concentration. Apply qualifiers as described in section 5.4. (The contaminant concentration is these blanks are multiplied

METHOD/INSTRUMENT/REAGENT BLANK ANALYSIS RESULTS

[illegible]

5.4 Do any field/rinse blanks have positive PCB results?

pending R 2/8/94

Note: Only field/rinse blanks taken the same day as the samples are used to qualify data. Blanks may not be qualified because of contamination in another blank. Blanks may be qualified for surrogate or calibration QC problems.

Action: Follow the directions in the table below to qualify PCB results due

to contamination. Use the largest value from all the associated blanks.

| | | |
|---------------------------------------------------|----------------------------------------------------------|-------------------------------------|
| CRQL < Sample conc < 5X blank value | Sample conc < CRQL < 5X blank value | CRQL < 5X blank value < Sample conc |
| Flag sample result with a "U"; cross out "B" flag | Reject sample result and report CRQL; cross out "B" flag | No qualification is needed |

Yes

No

N/A

5.5 Are there field/rinse/equipment blanks associated with every sample?

Action: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank.

6.0 Surrogate Recovery
[p.35 (F.G.'88)]

Yes

No

N/A

6.1 Are surrogate recovery values reported for all samples and blanks?

Yes

No

N/A

6.2 Are surrogate recovery values within established control limits for all samples and blanks?

*Sample 35306-2 analyzed
+ a dilution. Surrogate
results not reported for this
sample. No qualifier
assigned.*

Action: No qualification is done if surrogates are diluted beyond detection. If recovery is below contract limit (but above zero), flag all results for that sample "J". If recovery is zero, flag positive results "J", and non-detects "R". If recovery for the blank is zero, flag non-detects for all associated samples "R". If recovery is above contract limit, flag all positive results for that sample "J", unless in the reviewer's professional judgement the high recovery is due to co-eluting interference (check the associated blank - if recovery is high there also, flag the sample data).

SURROGATE RECOVERY VIOLATIONS

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |
| | | | |
| | | | |

| Sample ID | Surrogate Recovery | QC Limits | Q'fier |
|-----------|--------------------|-----------|--------|
| | | | |
| | | | |

Yes No N/A

6.3 Are there any transcription/calculation errors between the raw data and the reported surrogate recovery values?

Action: If large errors exist, call the lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

7.0 Matrix Spike/Matrix Spike Duplicate
[p.36 (F.G.'88)]

pending 7/27/94

Yes No N/A

7.1 Are the MS/MSD recovery values and resulting RPD values summarized?

7.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

Yes No N/A

a. Water

Yes No N/A

b. Soil

Action: If any of the matrix spike data are missing, call the lab for explanation/resubmittal.

Yes No N/A

7.3 Are any PCB spike recovery values outside QA limits?

MS/MSD RECOVERY VALUE VIOLATIONS

| Sample ID | Matrix | Compound | MS %
Rec | MSD %
Rec |
|-----------|--------|----------|-------------|--------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | |
|--|--|--|--|--|
| | | | | |
| | | | | |

Yes No N/A

7.4 Are any RPDs for matrix spike and matrix spike duplicate recovery values outside of QC limits?

MS/MSD RECOVERY VALUE RPD VIOLATIONS

| Sample ID | Matrix | Compound | RPD |
|-----------|--------|----------|-----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Action: If MS and MSD both have less than 10% recovery for a PCB, negative results for that analyte should be rejected, and positive results should be flagged "J". The above applies only to the sample used for the MS/MSD analysis. Use professional judgement in applying this criterion to other samples in the package.

Yes No N/A

7.5 Are there any transcription/calculation errors between the raw data and the reported MS/MSD recovery and RPD values?

Action: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and note errors in narrative.

8.0 Field Duplicates
[p.36 (F.G.'88)]

Yes No N/A

8.1 Were any field duplicates submitted for PCB analysis?

Action: Use the table on the next page to summarize data values and calculate values of relative percent difference.

FIELD DUPLICATE SUMMARY

[illegible]

| Compound | Value #1 | Value #2 | Relative %
Difference |
|----------|----------|----------|--------------------------|
| | | | |

Action: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

9.0 Compound Identification
[pp.37-38 (F.G.'88)]

Yes No N/A

9.1 For both the quantitation and confirmation column, were the retention times of the major component peaks within the retention time windows?

Yes No N/A

9.2 Are the relative peak height ratios of the major component peaks the same between the chromatographic patterns of the sample and the associated standard?

Action: If PCBs exhibit marginal pattern-matching quality, professional judgement should be used to establish whether the differences are attributable to environmental "weathering". If the presence of a PCB is strongly suggested, results should be reported as presumptively present (N).

If an observed pattern closely matches more than one Aroclor, professional judgment should be used to decide whether the neighboring Aroclor is a better match, or if multiple Aroclors are present.

Yes No N/A

9.0 Were any false negatives reported?

10.0 Compound Quantitation and Reported Detection Limits
[p.38 (F.G.'88)]

Yes No N/A

10.1 Are there any transcription/calculation errors in the sample results summary pages?

Note: PCB results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgment to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interfering compound is indicated, the lower of the two values

should be reported and qualified as presumptively present at an estimated quantity ("JN"). This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has obscured the attempt at a second column confirmation.

Yes No N/A

10.2 Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?

Action: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in narrative.

Action: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" value on the data summary form, and substitute it with data from the analysis of the diluted sample. Specify which data summary page is to be used, then draw a red "X" across the entire page of all of the other data summary pages for that sample that should not be used.

Yes No N/A

10.3 Does any soil sample contain more than 50% moisture?

Action: All data should be flagged as estimated.

11.0 Chromatogram Quality

Yes No N/A

11.1 Were the baselines stable?

Yes No N/A

11.2 Were any electropositive displacement (negative peaks) or unusual peaks seen?

Yes No N/A

11.3 Are early eluting PCBs sufficiently resolved for pattern identification?

ND reported
for non-detects.
1248 detected in all
samples



EcoChem, Inc.

Environmental Science and Chemistry

Appendix D
COMMUNICATION RECORDS

850131658



EcoChem, Inc.

COMMUNICATION RECORD

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|------------|
| <input type="checkbox"/> Phone in | <input type="checkbox"/> Meeting in | <input type="checkbox"/> Conference call | Date: 7/2/94 | Time: 1:20 |
| <input checked="" type="checkbox"/> Phone out | <input type="checkbox"/> Meeting out | | By: TED LEE | |
| Person: Steve Iohuni | | | Job or Proposal No.: 6702-1 | |
| Position: | | | <input checked="" type="checkbox"/> Current Job <input type="checkbox"/> Marketing | |
| Firm: ENSEZO / QUANTERA | | | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration | |
| Phone No.: 908-469-5800 | | | <input type="checkbox"/> Other: | |
| Route to: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | | | |
| Subject: (35152) | | | | |
| Notes: Called & left a message for Steve Iohuni to get faxed results for the field blank sample for 35152. | | | | |
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| Notes continued on back <input type="checkbox"/> | | | | |
| Follow-up Action Required: | | | | |
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| Action Taken: | | | | |
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| Action by: Date: | | | | |

cc: ☐ Marketing File ☐ Administration File: _____
☐ Project File ☐ Other File: _____

850131659



EcoChem, Inc.

COMMUNICATION RECORD

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/29/94 Time: 1130 |
| <input type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: TED LEE |
| Person: Steve Young | Job or Proposal No.: 6702-1 |
| Position: | <input checked="" type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: Rony | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 201 - 589-8996 | <input type="checkbox"/> Other: |
| Route to: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | |
| Subject: MS, MSD ID. (35152) | |
| Notes: Steve Young called to inform me that the Laboratory Mis ID'd the MS, MSD jars. They should be associated to IDDA-1 (35152-1) instead of IDDA-2 (35152-2). The benchsheet is therefore incorrect. Either way, both samples are reported as ND, so the MS/MSD results are unaffected. | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: Date: | |

cc: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131660



EcoChem, Inc.

COMMUNICATION RECORD

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <input type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/29/94 Time: 1:30 |
| <input checked="" type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: TED LEE |
| Person: Steve Safuni | Job or Proposal No.: 6702-1 |
| Position: | <input checked="" type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: Enesco | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 908-469-5800 | <input type="checkbox"/> Other: |
| Route to: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | |
| Subject: 20 Moisture (35152) | |
| Notes: Called Steve to get 20 Moisture numbers for samples
35152-1 and -2.

35152-1 = 13%
35152-2 = 19%

Also asked what he reported to Roux - which were both samples were NO for both samples. 1248 was present in 35152-2. However it was below their reporting level.
Also asked for field blank results for 34856 set and 35152 when they are analyzed. | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: Date: | |

cc: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131661



EcoChem, Inc.

COMMUNICATION RECORD

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| <input checked="" type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/17/94 Time: 1:30 |
| <input type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: R |
| Person: Steve Sabini / Dan Segal | Job or Proposal No.: 6702-1 |
| Position: | <input type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: Enesco | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 908-469-5800 | <input type="checkbox"/> Other: |
| Route to: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | |
| Subject: 1248 / 1254 (34856) | |
| Notes: Steve / Dan called (conference call) to discuss reporting method for 1248 / 1254 PCB collection. Dan felt uncomfortable with my suggestion of reporting for the values instead of just the higher value. After discussing the issue with them, and explaining my hesitancy in reporting only the higher value, they suggested a compromise: taking the full PCB area (from the beginning of 1248 to the end of 1254) and quantifying it to the 1248 & 1254. The higher higher value will then be reported. | |
| R 6/17/94 | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: Date: | |

cc: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131662



EcoChem, Inc.

COMMUNICATION RECORD

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 2/10 6/16/24 Time: 1:15 |
| <input type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: <u>RL</u> |
| Person: <u>Peter Palho</u> | Job or Proposal No.: <u>6702-1</u> |
| Position: | <input type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: <u>Roux</u> | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: <u>201 589-8996</u> | <input type="checkbox"/> Other: _____ |
| Route to: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ | |
| Subject: <u>1254/1248 reporting . (34556)</u> | |
| Notes: <u>Peter Palho called to receive clarification regarding 1248/1254</u>
<u>coelution and the reporting of numbers. I explained to him to process</u>
<u>the quantitating the PCP's and how Enesco's reporting method may be</u>
<u>potentially low. He said he'll call Enesco to clarify the way he wants</u>
<u>to report this (to report both numbers) in order to get a validation</u>
<u>report from Ecochem that won't "be open ended".</u> | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: _____ Date: _____ | |

cc: ☐ Marketing File ☐ Administration File: _____
☐ Project File ☐ Other File: _____

850131663



EcoChem, Inc.

COMMUNICATION RECORD

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------------------------|------------|
| <input type="checkbox"/> Phone in | <input type="checkbox"/> Meeting in | <input type="checkbox"/> Conference call | Date: 6/13/94 | Time: 8:30 |
| <input checked="" type="checkbox"/> Phone out | <input type="checkbox"/> Meeting out | | By: Ted Lee. | |
| Person: Steve Young | | | Job or Proposal No.: 6702-1 | |
| Position: | | | <input type="checkbox"/> Current Job <input type="checkbox"/> Marketing | |
| Firm: Ronx Associates Inc. | | | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration | |
| Phone No.: 201 - 584 - 8896 | | | <input type="checkbox"/> Other: | |
| Route to: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | | | |
| Subject: 1254/1248 collection. (34856) | | | | |
| Notes: Called Steve Young to make sure he understood my fax # ² sent 6/13/94 regarding 1248 and 1254 collection in samples APSS-1, -2, & -3. He said he'll discuss the issue with Peter and either get back to me or Steve Infanti at Enceco to change the reporting format. | | | | |
| Notes continued on back <input type="checkbox"/> | | | | |
| Follow-up Action Required: | | | | |
| Action Taken: | | | | |
| Action by: | | | Date: | |

c: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131664



EcoChem, Inc.

COMMUNICATION RECORD

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <input type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/10/94 Time: 12 ³⁰ |
| <input checked="" type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: TED LEE. |
| Person: Steve Lafuni | Job or Proposal No.: 6702-1 |
| Position: Program Manager | <input checked="" type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: Euseco East | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 908-469-5800 | <input type="checkbox"/> Other: _____ |
| Route to: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ | |
| Subject: 34856 GH. (34856) | |
| Notes: Called Steve Lafuni to get percent moisture - | |
| 34856-1 = 6.3% | |
| └ -2 = 13% | |
| -3 = 7.8% | |
| Also, the extracted weight values are reported to 2 sig. figs. Therefore, 2.09 g is reported and calculated as 2.1 g. | |
| TL 6/10/94 | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: Date: | |

: ☐ Marketing File ☐ Administration File: _____

- ☐ Project File ☐ Other File: _____

850131665



EcoChem, Inc.

COMMUNICATION RECORD

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <input type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/10/94 Time: 9 ⁰⁰ |
| <input checked="" type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: TED LEE |
| Person: Steve Young | Job or Proposal No.: 6702-1 |
| Position: Ronx | <input type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: L | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 201 589- 886 8996 | <input type="checkbox"/> Other: _____ |
| Route to: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ | |
| Subject: Data H Enesco - (34856) | |
| Notes: Called Steve to tell him that I haven't received data H Enesco i how soon Aiel want results from us. He said that if he he could get a fax results or verbal result by 7:30 am Monday (6/13) his time, so he can start backfilling Monday, that would be fine. | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: | Date: |

cc: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131666



EcoChem, Inc.

COMMUNICATION RECORD

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Phone in <input type="checkbox"/> Meeting in <input type="checkbox"/> Conference call | Date: 6/7/94 Time: 11:00 |
| <input type="checkbox"/> Phone out <input type="checkbox"/> Meeting out | By: TED LOE |
| Person: Dan Segal | Job or Proposal No.: _____ |
| Position: CC Supervisor | <input type="checkbox"/> Current Job <input type="checkbox"/> Marketing |
| Firm: Enesco East | <input type="checkbox"/> Past Job <input type="checkbox"/> Administration |
| Phone No.: 908-469-5800 | <input type="checkbox"/> Other: _____ |
| Route to: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ | |
| Subject: Surrogate calculation. 34494 | |
| Notes:
Ted spoke w/ Dan about having difficulty getting surrogate calculations to agree for TRX and DCP.
He said they ran a new 1660 curve. I requested to have them fax the plots of this curve showing the coefficients from the quadratic. Also requested hard copy of the whole curve to be shipped Fed ex. with the other data I requested 6/6/94. | |
| Notes continued on back <input type="checkbox"/> | |
| Follow-up Action Required: | |
| Action Taken: | |
| Action by: _____ Date: _____ | |

cc: ☐ Marketing File ☐ Administration File: _____

☐ Project File ☐ Other File: _____

850131667

Amboy Aggregates

P.O. Box 3220

Lower Main Street

South Amboy, New Jersey 08879

(908) 525-0620

July 11, 1994

Westinghouse Remediation Services, Inc.

255 Business Center Drive

Suite A

Horsham, PA 19044

Attention: Gould Hunter

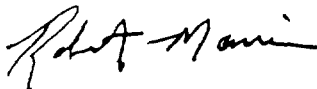
Reference: Clean Fill

Dear Sirs:

Amboy Aggregates certifies that material provided to this project is a virgin sand and silt mix from an environmentally clean source and contains no off-site or recycled materials. The material as stated is produced and stockpiled on site insuring no condamination. The material is provided from our location at Block #161, Lot #25 on Lower Main Street, South Amboy.

Clean fill materail is suitable for construction and backfill purposes.

Sincerely,



Robert Manis
Sales Manager

RM:nb

850131669



WIMPEY MINERALS

P.O. Box 561
Lake Hopatcong, N.J. 07849-0561
Phone (201) 663-1800 • FAX (201) 663-0909

March 22, 1994

Westinghouse Remediation Services, Inc.
255 Business Center Drive, Suite A
Horsham, PA 190444

Attention: Gould Hunter

RE: 3/4" Clean Stone #57
2 1/2 Washed Stone
3/4 QP
#2 Coarse Aggregate
Clean Fill
Monsanto
Kearny, NJ

Dear Sirs:

Wimpey Minerals USA, Inc. T/A Hopatcong Crushed Stone certifies that material provided to this project is virgin stone from a known environmentally clean source and contains no off-site or recycled materials. The material as stated is produced and stock piled on site insuring no contamination. The material is provided from the operation of our quarrying facility at Block 7001, Lot 1, in the Borough of Hopatcong, Sussex County, New Jersey.

The material for the Bentonite mix is a blend of soil and crushed fines. If any further testing is required samples of all materials will be available to you upon request.

850131670

Clean stone material is suitable for construction and backfill purposes.

If you require any additional information, please do not hesitate to contact me.

Sincerely,
Wimpey Minerals USA, Inc.

Glenn Gruen, P.A.T.
Quality Control & Materials

Glenn Gruen
GG/cp FAX - 1-215-957-6642

850131671

11 194 11135 0000 SHIPAL 515 series

**STAVOLA
CONSTRUCTION
MATERIALS, INC.****EXECUTIVE OFFICE**Haddon Rd.
Union Mills, NJ908-542-2320**PLANT**Timney Rock Rd.
Bound Brook, NJ908-356-5700**AUTHORIZED REPLY**P.O. Box 403
Red Bank, NJ 07701DATE: 4-27-94George
RINGUEGRANA

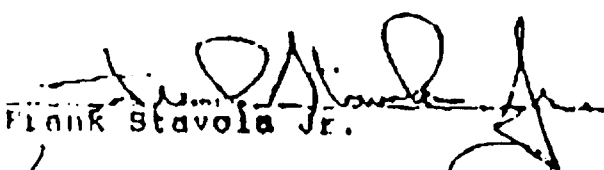
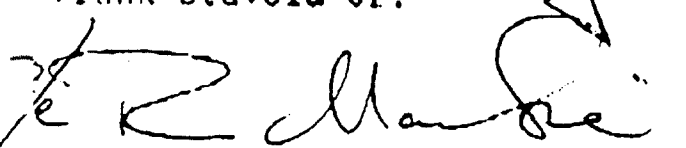
BANK RUN SAND
(SOURCE LAKEWOOD PLANT)
REF: Various gradations of Crushed Stone, &
Fill/Overburden Purchased from our
Bound Brook Quarry

TO WHOM IT MAY CONCERN:

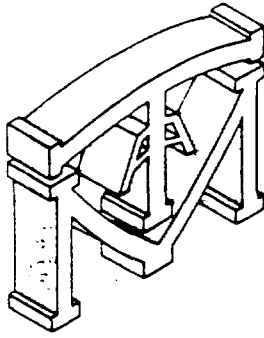
The above referenced material is Environmentally Clean, Virgin Material.

If there are any other questions, please feel free to give our office a call at 908-356-5700, or 542-2328 x 236 Quality Control.

Very truly yours,


Frank Stavola Jr.
Chief Dispatcher

850131672



**MELICK-TULLY
AND ASSOCIATES, INC**
GEOTECHNICAL ENGINEERS AND
ENVIRONMENTAL CONSULTANTS
117 CANAL RD., SOUTH BOUND BROOK, NJ 081
(908) 356-3400 FAX: (908) 356-5

PRINCIPALS:
THOMAS E. TULLY, P.E.
CHARLES T. MELICK, P.E.
ROBERT J. VAN OORDEN, P.E.
THOMAS E. TULLY, P.E.
HER JR., P.E.
JANKERT, P.E.
OROWITZ, P.E.

Soil Compaction

ASSOCIATES:
S. MICKLUS, P.E.
M. STRUBEL, P.E.

August 10, 1991

Westinghouse Remediation Services, Inc.
255 Business Center Drive, Suite A
Horsham, Pennsylvania 19044

Attention: Mr. Gould Hunter

Gentlemen:

**Report
On-Site Soils Engineering Services
Contaminated Soil Replacement
Kearny, New Jersey
Monsanto Corporation**

Introduction

This report presents the results of our on-site soils engineering services provided during the placement of compacted fill soils that replaced contaminated materials that were present at the Monsanto Corporation site in Kearny, New Jersey. The site is located adjacent to and north of Pennsylvania Avenue.

Purpose and Scope of Work

The purpose of our services was to perform in-place field density tests within the compacted fill soils. A representative of our firm was present at the site during the fill placement and compaction operations. After each lift of fill was placed, it was tested in accordance with the ASTM D-2922 test procedure using a Troxler 3411B Nuclear Density Gauge. Test results were provided to Westinghouse site personnel as they were developed.

850131674

Discussion

Three excavations were backfilled at the site and were referred to as the SSP, APSS and the PDA excavations. Approximate dimensions of the excavations are tabulated below:

| <u>Excavation</u> | <u>Approximate
Plan Dimension
(feet)</u> | <u>Approximate Depth
(feet)</u> |
|-------------------|--------------------------------------------------|-------------------------------------|
| SSP | 21 x 35 | 9 to 10.5 |
| APSS | 40 x 35 | 9 |
| PDA | 67 x 79* | 8* |

- * Dimensions of the outer PDA excavation. Within this excavation was the inner PDA excavation, approximately 37 feet by 48 feet in plan dimensions and approximately 15 feet deeper than the level of the outer PDA excavation.

With the exception of the lower portions of the inner PDA excavation, the excavations were filled with compacted granular soils. Below a depth of four feet beneath the finished grade, the soils were to be placed in twelve inch thick lifts, while above a depth of four feet, six inch thick lifts were to be used. The lower portion of the inner PDA excavation was filled with clean washed stone up to approximately five feet below level of the outer PDA excavation. Above the stone, a layer of filter fabric was placed, followed by a five feet thick sand/bentonite layer. Approximately eight pounds of bentonite were mixed with each cubic foot of soil. The sand/bentonite was placed in twelve inch thick lifts. The remainder of the inner PDA excavation was filled with compacted granular soils.

Specifications for the work called for each layer of the granular fill to be compacted to an average of 95 percent of the ASTM D-698 maximum dry density. Each layer of the soil/bentonite mixture was to be compacted to an average of 90 percent.

Samples of the granular fill and the sand to be mixed with the bentonite were provided to us by Westinghouse. The results of a mechanical grain size analysis and laboratory compaction test (ASTM D-698) performed on the sample of granular fill are shown on Plate 1A.

A mechanical grain-size analysis and laboratory compaction test was also performed on the sand sample. The compaction test indicated a maximum dry density of 111 pounds per cubic foot. Assuming that the soil in the field would be compacted to 90 percent of this maximum dry density or approximately 100 pound per cubic foot, bentonite was added to the soil in the ratio of 8 pounds of bentonite to 100 pounds of dry soil. A laboratory compaction test was then performed on the soil/bentonite mixture and the results of this test are shown on Plate 1B, with the grain size analyses of the original sand sample.

Numerous in-place density tests were performed on each layer of fill that was placed. The results of the density tests were compared to the appropriate laboratory compaction test to evaluate the degree of compaction achieved. The results of the in-place density tests are shown on Plates 2A through 2E.

Conclusions

Based on the results of our testing, it is our opinion that the granular soil and sand/bentonite layers have been compacted to the requirements of the specifications.

The following Plates are attached and complete this report.

Plate 1A - Gradation and Compaction Data - Granular Fill
Plate 1B - Gradation and Compaction Data - Sand/Bentonite
Plates 2A through 2E - Summary of In-Place Density Test Results

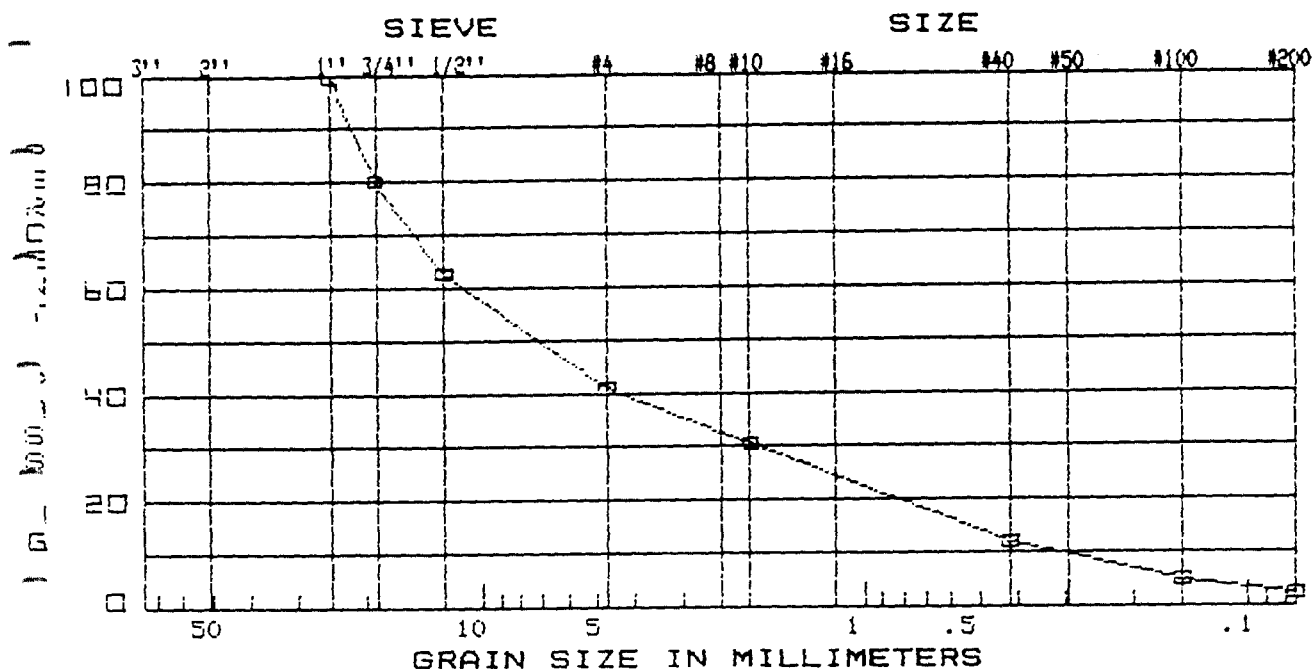
Very truly yours,

MELICK-TULLY and ASSOCIATES, INC.


Charles T. Melick, P.E.

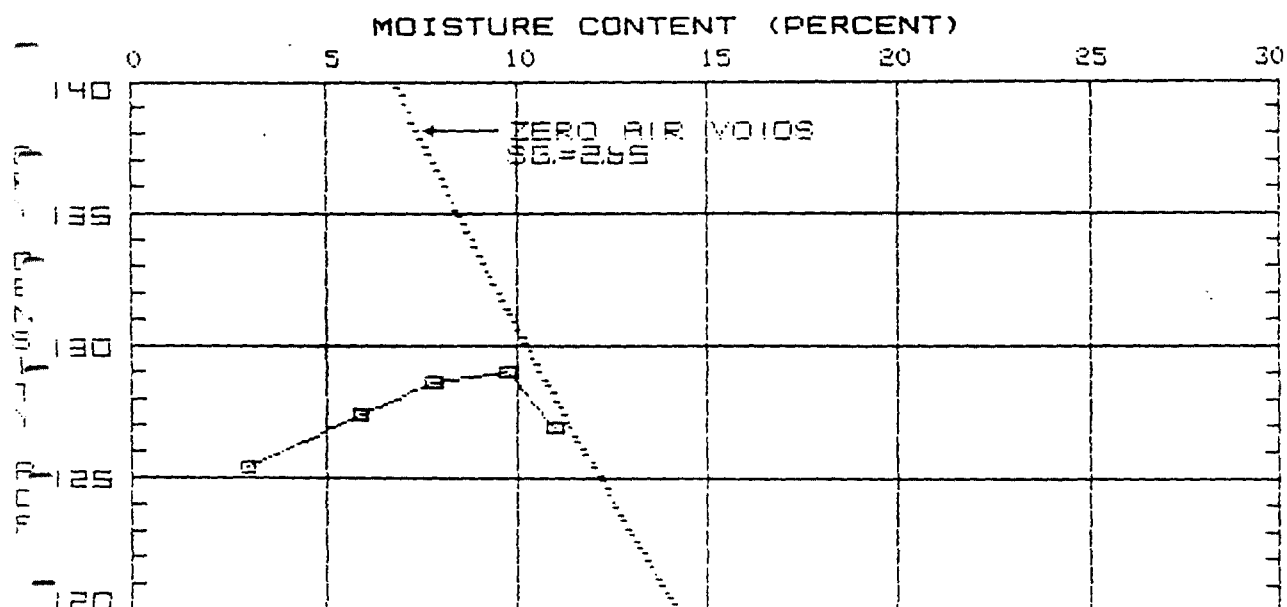
UNIFIED SOIL CLASSIFICATION

| COBBLES | GRAVEL | | SAND | | | SILT
OR
CLAY |
|---------|--------|------|--------|--------|------|--------------------|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |



SOURCE : UNKNOWN
 LOCATION : HOPATCONG, N.J.
 SYMBOL : GW
 DESCRIPTION : FINE TO COARSE GRAVEL, AND FINE TO COARSE SAND, TRACE SILT

LL (%) : --
 PL (%) : --
 MC (%) : 2.4



MAXIMUM DRY DENSITY : 129.0 PCF
 OPTIMUM MOISTURE CONTENT : 9.7 %
 TEST METHOD : ASTM D 698

GRADATION AND COMPACTION DATA

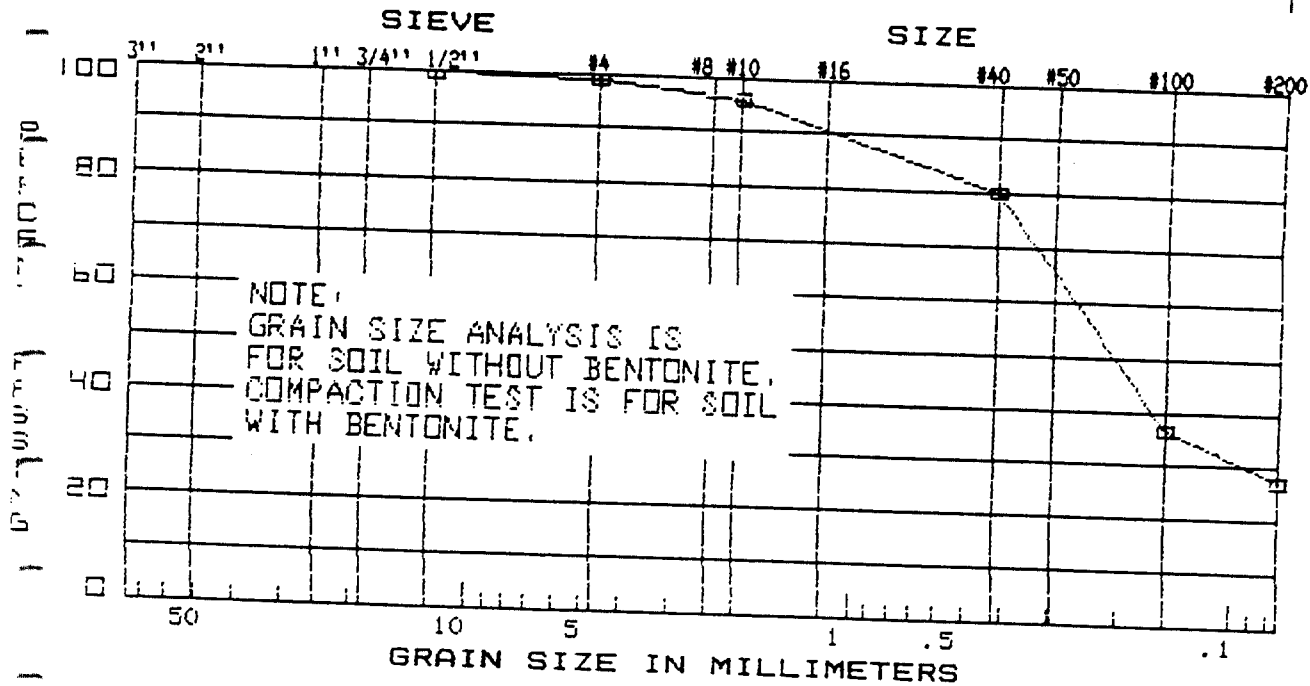
JOB NO. 5234-001 MELICK-TULLY AND ASSOCIATES, INC.

PLATE 1A

850131677

UNIFIED SOIL CLASSIFICATION

| BOBBLES | GRAVEL | | SAND | | | SILT
OR
CLAY |
|---------|--------|------|--------|--------|------|--------------------|
| | COARSE | FINE | COARSE | MEDIUM | FINE | |



SOURCE : UNKNOWN

LOCATION : KEARNY, NJ

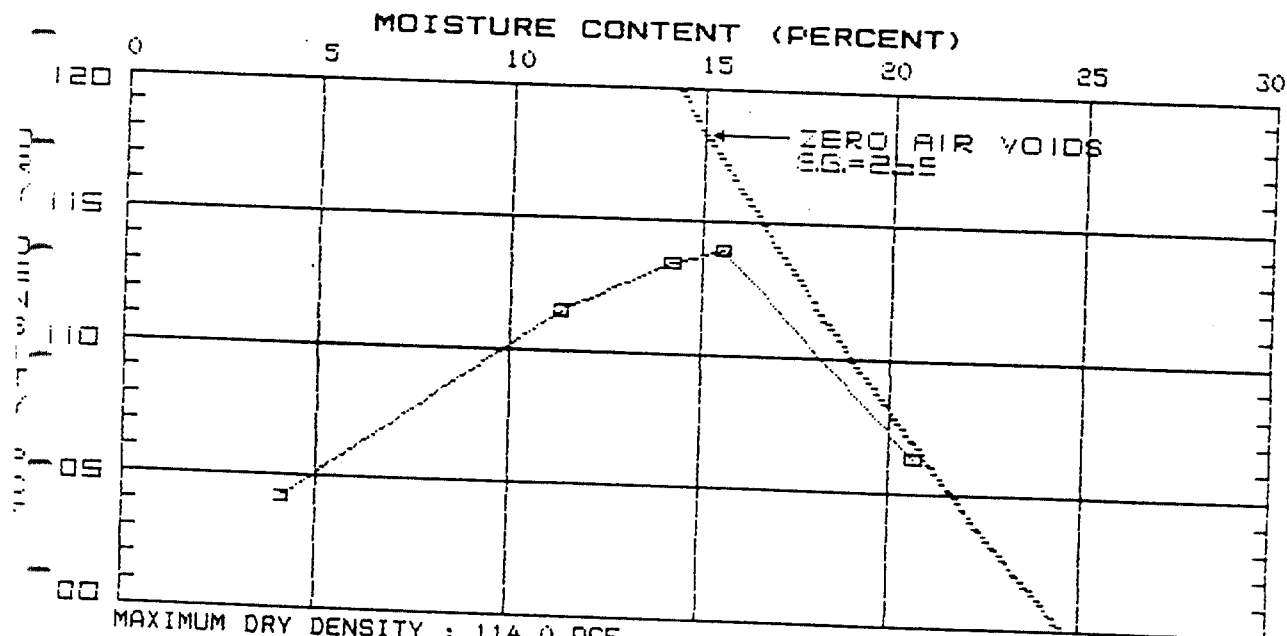
SYMBOL : SM

DESCRIPTION : FINE TO MEDIUM SAND, SOME SILT

LL (%) : --

PL (%) : --

MC (%) : 9.8



TEST METHOD : ASTM D 698

GRADATION AND COMPACTION DATA

JOB NO. 5224-001 MELICK-TULLY AND ASSOCIATES, INC.

PLATE 1B

850131678

FIELD DENSITY TEST RESULTS
MONSANTO CORPORATION
KEARNY, NEW JERSEY

| TEST
NO | TEST
DATE | AREA | DEPTH ¹
(FEET) | FIELD
MOIST
CONT | FIELD
DRY
DENS. | MAX ²
DRY
DENS. | %
COMP | REMARKS |
|------------|--------------|------|------------------------------|------------------------|-----------------------|----------------------------------|-----------|---------|
| 1 | 06/06/94 | SSP | -09.0 | 3.5 | 126.7 | 129 | 98 | |
| 2 | 06/06/94 | SSP | -09.0 | 2.9 | 122.8 | 129 | 95 | |
| 3 | 06/06/94 | SSP | -08.0 | 4.2 | 131.7 | 129 | 102 | |
| 4 | 06/06/94 | SSP | -08.0 | 3.3 | 125.0 | 129 | 97 | |
| 5 | 06/06/94 | SSP | -08.0 | 3.3 | 123.7 | 129 | 96 | |
| 6 | 06/06/94 | SSP | -08.0 | 1.9 | 120.3 | 129 | 93 | |
| 7 | 06/06/94 | SSP | -07.0 | 7.1 | 127.9 | 129 | 99 | |
| 8 | 06/06/94 | SSP | -07.0 | 5.7 | 127.8 | 129 | 99 | |
| 9 | 06/06/94 | SSP | -07.0 | 6.1 | 126.7 | 129 | 98 | |
| 10 | 06/06/94 | SSP | -07.0 | 5.8 | 126.1 | 129 | 98 | |
| 11 | 06/06/94 | SSP | -06.5 | 2.8 | 125.6 | 129 | 97 | |
| 12 | 06/06/94 | SSP | -06.5 | 3.9 | 127.4 | 129 | 99 | |
| 13 | 06/06/94 | SSP | -06.5 | 5.1 | 135.0 | 129 | 105 | |
| 14 | 06/06/94 | SSP | -06.5 | 2.6 | 120.6 | 129 | 93 | |
| 15 | 06/06/94 | SSP | -05.5 | 3.0 | 125.0 | 129 | 97 | |
| 16 | 06/06/94 | SSP | -05.5 | 2.9 | 127.0 | 129 | 98 | |
| 17 | 06/06/94 | SSP | -05.5 | 2.8 | 122.2 | 129 | 95 | |
| 18 | 06/06/94 | SSP | -05.5 | 2.9 | 124.7 | 129 | 97 | |
| 19 | 06/06/94 | SSP | -05.0 | 2.8 | 125.6 | 129 | 97 | |
| 20 | 06/06/94 | SSP | -05.0 | 3.0 | 126.2 | 129 | 98 | |
| 21 | 06/06/94 | SSP | -05.0 | 3.1 | 123.7 | 129 | 96 | |
| 22 | 06/06/94 | SSP | -05.0 | 3.8 | 122.3 | 129 | 95 | |
| 23 | 06/06/94 | SSP | -04.0 | 2.9 | 125.5 | 129 | 97 | |
| 24 | 06/06/94 | SSP | -04.0 | 3.4 | 123.9 | 129 | 96 | |
| 25 | 06/06/94 | SSP | -04.0 | 2.9 | 122.6 | 129 | 95 | |
| 26 | 06/06/94 | SSP | -04.0 | 3.8 | 122.2 | 129 | 95 | |
| 27 | 06/06/94 | SSP | -03.5 | 3.3 | 129.7 | 129 | 101 | |
| 28 | 06/06/94 | SSP | -03.5 | 2.7 | 123.3 | 129 | 96 | |
| 29 | 06/08/94 | SSP | -03.5 | 3.0 | 125.0 | 129 | 97 | |
| 30 | 06/08/94 | SSP | -03.5 | 3.5 | 128.6 | 129 | 100 | |
| 31 | 06/08/94 | SSP | -03.0 | 3.1 | 129.3 | 129 | 100 | |
| 32 | 06/08/94 | SSP | -03.0 | 3.5 | 126.2 | 129 | 98 | |
| 33 | 06/08/94 | SSP | -03.0 | 3.5 | 123.3 | 129 | 96 | |
| 34 | 06/08/94 | SSP | -03.0 | 4.0 | 125.1 | 129 | 97 | |
| 35 | 06/08/94 | SSP | -02.5 | 3.8 | 129.7 | 129 | 101 | |
| 36 | 06/08/94 | SSP | -02.5 | 3.4 | 127.8 | 129 | 99 | |
| 37 | 06/08/94 | SSP | -02.5 | 3.1 | 123.0 | 129 | 95 | |
| 38 | 06/08/94 | SSP | -02.5 | 3.0 | 120.0 | 129 | 93 | |
| 39 | 06/08/94 | SSP | -02.0 | 3.4 | 131.1 | 129 | 102 | |
| 40 | 06/08/94 | SSP | -02.0 | 3.2 | 125.5 | 129 | 97 | |
| 41 | 06/08/94 | SSP | -02.0 | 3.5 | 124.0 | 129 | 96 | |
| 42 | 06/08/94 | SSP | -02.0 | 3.0 | 126.1 | 129 | 98 | |

1. BELOW PLANNED FINISH GRADE
2. ASTM D1557 TEST PROCEDURE

FIELD DENSITY TEST RESULTS
MONSANTO CORPORATION
KEARNY, NEW JERSEY

| TEST
NO | TEST
DATE | AREA | DEPTH ¹
(FEET) | FIELD
MOIST
CONT | FIELD
DRY
DENS. | MAX ²
DRY
DENS. | %
COMP | REMARKS |
|------------|--------------|------|------------------------------|------------------------|-----------------------|----------------------------------|-----------|---------|
| 43 | 06/08/94 | SSP | -01.5 | 3.3 | 123.1 | 129 | 95 | |
| 44 | 06/08/94 | SSP | -01.5 | 3.9 | 125.0 | 129 | 97 | |
| 45 | 06/08/94 | SSP | -01.5 | 3.4 | 124.1 | 129 | 96 | |
| 46 | 06/08/94 | SSP | -01.5 | 4.2 | 127.0 | 129 | 98 | |
| 47 | 06/08/94 | SSP | -01.0 | 4.2 | 126.4 | 129 | 98 | |
| 48 | 06/08/94 | SSP | -01.0 | 3.7 | 127.6 | 129 | 99 | |
| 49 | 06/08/94 | SSP | -01.0 | 3.4 | 126.7 | 129 | 98 | |
| 50 | 06/08/94 | SSP | -01.0 | 3.4 | 125.3 | 129 | 97 | |
| 51 | 06/13/94 | APSS | -08.0 | 4.4 | 128.5 | 129 | 100 | |
| 52 | 06/13/94 | APSS | -08.0 | 4.9 | 124.7 | 129 | 97 | |
| 53 | 06/13/94 | APSS | -08.0 | 5.0 | 133.4 | 129 | 103 | |
| 54 | 06/13/94 | APSS | -08.0 | 3.8 | 126.5 | 129 | 98 | |
| 55 | 06/13/94 | APSS | -07.0 | 4.4 | 128.9 | 129 | 100 | |
| 56 | 06/13/94 | APSS | -07.0 | 3.1 | 126.3 | 129 | 98 | |
| 57 | 06/13/94 | APSS | -07.0 | 3.9 | 128.5 | 129 | 100 | |
| 58 | 06/13/94 | APSS | -07.0 | 3.7 | 129.0 | 129 | 100 | |
| 59 | 06/14/94 | APSS | -06.0 | 3.7 | 125.6 | 129 | 97 | |
| 60 | 06/14/94 | APSS | -06.0 | 3.4 | 125.4 | 129 | 97 | |
| 61 | 06/14/94 | APSS | -06.0 | 3.5 | 123.6 | 129 | 96 | |
| 62 | 06/14/94 | APSS | -06.0 | 4.1 | 129.7 | 129 | 101 | |
| 63 | 06/14/94 | APSS | -05.0 | 4.4 | 131.2 | 129 | 102 | |
| 64 | 06/14/94 | APSS | -05.0 | 4.0 | 127.3 | 129 | 99 | |
| 65 | 06/14/94 | APSS | -05.0 | 3.6 | 125.5 | 129 | 97 | |
| 66 | 06/14/94 | APSS | -05.0 | 3.2 | 123.8 | 129 | 96 | |
| 67 | 06/14/94 | APSS | -04.0 | 3.2 | 121.4 | 129 | 94 | |
| 68 | 06/14/94 | APSS | -04.0 | 4.1 | 123.4 | 129 | 96 | |
| 69 | 06/14/94 | APSS | -04.0 | 4.2 | 129.2 | 129 | 100 | |
| 70 | 06/14/94 | APSS | -04.0 | 4.1 | 127.8 | 129 | 99 | |
| 71 | 06/15/94 | APSS | -03.5 | 3.9 | 127.8 | 129 | 99 | |
| 72 | 06/15/94 | APSS | -03.5 | 2.9 | 127.6 | 129 | 99 | |
| 73 | 06/15/94 | APSS | -03.5 | 3.9 | 127.5 | 129 | 99 | |
| 74 | 06/15/94 | APSS | -03.5 | 3.9 | 130.0 | 129 | 101 | |
| 75 | 06/15/94 | APSS | -03.0 | 4.2 | 131.3 | 129 | 102 | |
| 76 | 06/15/94 | APSS | -03.0 | 3.1 | 128.8 | 129 | 100 | |
| 77 | 06/15/94 | APSS | -03.0 | 3.4 | 129.2 | 129 | 100 | |
| 78 | 06/15/94 | APSS | -03.0 | 3.8 | 127.8 | 129 | 99 | |
| 79 | 06/15/94 | APSS | -02.5 | 3.3 | 123.8 | 129 | 96 | |
| 80 | 06/15/94 | APSS | -02.5 | 3.5 | 123.2 | 129 | 96 | |
| 81 | 06/15/94 | APSS | -02.0 | 3.5 | 127.9 | 129 | 99 | |
| 82 | 06/15/94 | APSS | -02.0 | 3.5 | 128.4 | 129 | 100 | |
| 83 | 06/16/94 | APSS | -01.5 | 4.0 | 128.2 | 129 | 99 | |
| 84 | 06/16/94 | APSS | -01.5 | 3.4 | 125.1 | 129 | 97 | |

1. BELOW PLANNED FINISH GRADE
2. ASTM D1557 TEST PROCEDURE

FIELD DENSITY TEST RESULTS
MONSANTO CORPORATION
KEARNY, NEW JERSEY

| TEST
NO | TEST
DATE | AREA | DEPTH ¹
(FEET) | FIELD
MOIST
CONT | FIELD
DRY
DENS. | MAX ²
DRY
DENS. | %
COMP | REMARKS |
|------------|--------------|------------|------------------------------|------------------------|-----------------------|----------------------------------|-----------|----------------|
| 85 | 06/16/94 | APSS | -01.0 | 3.8 | 126.8 | 129 | 98 | |
| 86 | 06/16/94 | APSS | -01.0 | 3.6 | 127.0 | 129 | 98 | |
| 87 | 06/16/94 | APSS | -00.5 | 3.4 | 129.7 | 129 | 101 | |
| 88 | 06/16/94 | APSS | -00.5 | 4.0 | 128.6 | 129 | 100 | |
| 89 | 07/11/94 | PDA(OUTER) | -07.0 | 3.3 | 123.4 | 129 | 96 | |
| 90 | 07/11/94 | PDA(OUTER) | -07.0 | 3.4 | 125.9 | 129 | 98 | |
| 91 | 07/11/94 | PDA(OUTER) | -07.0 | 3.7 | 121.4 | 129 | 94 | |
| 92 | 07/11/94 | PDA(OUTER) | -07.0 | 3.9 | 123.5 | 129 | 96 | |
| 93 | 07/11/94 | PDA(OUTER) | -06.0 | 3.6 | 128.0 | 129 | 99 | |
| 94 | 07/11/94 | PDA(OUTER) | -06.0 | 4.0 | 127.4 | 129 | 99 | |
| 95 | 07/11/94 | PDA(OUTER) | -06.0 | 3.7 | 122.5 | 129 | 95 | |
| 96 | 07/11/94 | PDA(OUTER) | -06.0 | 4.2 | 129.7 | 129 | 101 | |
| 97 | 07/12/94 | PDA(OUTER) | -05.0 | 3.4 | 125.4 | 129 | 97 | |
| 98 | 07/12/94 | PDA(OUTER) | -05.0 | 4.2 | 129.2 | 129 | 100 | |
| 99 | 07/12/94 | PDA(OUTER) | -05.0 | 3.8 | 123.5 | 129 | 96 | |
| 100 | 07/12/94 | PDA(OUTER) | -05.0 | 3.9 | 124.0 | 129 | 96 | |
| 101 | 07/12/94 | PDA(OUTER) | -04.0 | 4.1 | 125.0 | 129 | 97 | |
| 102 | 07/12/94 | PDA(OUTER) | -04.0 | 3.6 | 124.0 | 129 | 96 | |
| 103 | 07/12/94 | PDA(OUTER) | -04.0 | 3.4 | 127.4 | 129 | 99 | |
| 104 | 07/12/94 | PDA(OUTER) | -04.0 | 3.4 | 123.0 | 129 | 95 | |
| 105 | 07/12/94 | PDA(OUTER) | -03.5 | 3.0 | 122.6 | 129 | 95 | |
| 106 | 07/12/94 | PDA(OUTER) | -03.5 | 5.0 | 129.9 | 129 | 101 | |
| 107 | 07/12/94 | PDA(OUTER) | -03.5 | 3.7 | 124.8 | 129 | 97 | |
| 108 | 07/12/94 | PDA(OUTER) | -03.5 | 3.9 | 123.0 | 129 | 95 | |
| 109 | 07/12/94 | PDA(OUTER) | -03.0 | 4.0 | 127.1 | 129 | 99 | |
| 110 | 07/12/94 | PDA(OUTER) | -03.0 | 4.1 | 130.5 | 129 | 101 | |
| 111 | 07/12/94 | PDA(OUTER) | -02.5 | 3.5 | 124.7 | 129 | 97 | |
| 112 | 07/12/94 | PDA(OUTER) | -02.5 | 3.8 | 127.4 | 129 | 99 | |
| 113 | 07/13/94 | PDA(OUTER) | -02.0 | 4.1 | 129.1 | 129 | 100 | |
| 114 | 07/13/94 | PDA(OUTER) | -02.0 | 4.0 | 129.7 | 129 | 101 | |
| 115 | 07/13/94 | PDA(OUTER) | -01.5 | 4.6 | 132.8 | 129 | 103 | |
| 116 | 07/13/94 | PDA(OUTER) | -01.5 | 4.3 | 130.9 | 129 | 101 | |
| 117 | 07/13/94 | PDA(OUTER) | -01.0 | 4.5 | 129.9 | 129 | 101 | |
| 118 | 07/13/94 | PDA(OUTER) | -01.0 | 3.4 | 128.5 | 129 | 100 | |
| 119 | 07/13/94 | PDA(OUTER) | -00.5 | 4.4 | 128.9 | 129 | 100 | |
| 120 | 07/13/94 | PDA(OUTER) | -00.5 | 3.8 | 124.2 | 129 | 96 | |
| 121 | 07/13/94 | PDA(OUTER) | 00.0 | 5.3 | 132.0 | 129 | 102 | |
| 122 | 07/13/94 | PDA(OUTER) | 00.0 | 4.2 | 124.3 | 129 | 96 | |
| 123 | 07/15/94 | PDA(INNER) | -14.0 | 13.3 | 106.6 | 114 | 94 | SAND/BENTONITE |
| 124 | 07/15/94 | PDA(INNER) | -14.0 | 12.0 | 100.5 | 114 | 88 | SAND/BENTONITE |
| 125 | 07/15/94 | PDA(INNER) | -14.0 | 11.9 | 106.5 | 114 | 93 | SAND/BENTONITE |
| 126 | 07/15/94 | PDA(INNER) | -14.0 | 14.0 | 106.4 | 114 | 93 | SAND/BENTONITE |

1. BELOW PLANNED FINISH GRADE
2. ASTM D1557 TEST PROCEDURE

FIELD DENSITY TEST RESULTS
MONSANTO CORPORATION
KEARNY, NEW JERSEY

| TEST
NO | TEST
DATE | AREA | DEPTH ¹
(FEET) | FIELD
MOIST
CONT | FIELD
DRY
DENS. | MAX ²
DRY
DENS. | %
COMP | REMARKS |
|------------|--------------|-------------|------------------------------|------------------------|-----------------------|----------------------------------|-----------|----------------|
| 127 | 07/15/94 | PDA (INNER) | -13.0 | 13.4 | 107.3 | 114 | 94 | SAND/BENTONITE |
| 128 | 07/15/94 | PDA (INNER) | -13.0 | 12.6 | 110.2 | 114 | 97 | SAND/BENTONITE |
| 129 | 07/15/94 | PDA (INNER) | -13.0 | 12.7 | 109.4 | 114 | 96 | SAND/BENTONITE |
| 130 | 07/15/94 | PDA (INNER) | -13.0 | 14.3 | 106.0 | 114 | 93 | SAND/BENTONITE |
| 131 | 07/19/94 | PDA (INNER) | -12.0 | 13.5 | 106.7 | 114 | 94 | SAND/BENTONITE |
| 132 | 07/19/94 | PDA (INNER) | -12.0 | 14.1 | 112.2 | 114 | 98 | SAND/BENTONITE |
| 133 | 07/19/94 | PDA (INNER) | -12.0 | 12.8 | 102.2 | 114 | 90 | SAND/BENTONITE |
| 134 | 07/19/94 | PDA (INNER) | -12.0 | 12.9 | 103.8 | 114 | 91 | SAND/BENTONITE |
| 135 | 07/19/94 | PDA (INNER) | -11.0 | 14.6 | 112.0 | 114 | 98 | SAND/BENTONITE |
| 136 | 07/19/94 | PDA (INNER) | -11.0 | 15.3 | 113.4 | 114 | 99 | SAND/BENTONITE |
| 137 | 07/19/94 | PDA (INNER) | -11.0 | 12.2 | 101.0 | 114 | 89 | SAND/BENTONITE |
| 138 | 07/19/94 | PDA (INNER) | -11.0 | 12.1 | 105.4 | 114 | 92 | SAND/BENTONITE |
| 139 | 07/20/94 | PDA (INNER) | -10.0 | 12.9 | 103.0 | 114 | 90 | SAND/BENTONITE |
| 140 | 07/20/94 | PDA (INNER) | -10.0 | 13.1 | 102.9 | 114 | 90 | SAND/BENTONITE |
| 141 | 07/20/94 | PDA (INNER) | -10.0 | 14.2 | 108.4 | 114 | 95 | SAND/BENTONITE |
| 142 | 07/20/94 | PDA (INNER) | -10.0 | 13.4 | 103.3 | 114 | 91 | SAND/BENTONITE |
| 143 | 07/21/94 | PDA (INNER) | -09.0 | 4.6 | 125.9 | 129 | 98 | |
| 144 | 07/21/94 | PDA (INNER) | -09.0 | 4.4 | 122.1 | 129 | 95 | |
| 145 | 07/21/94 | PDA (INNER) | -09.0 | 4.7 | 127.1 | 129 | 99 | |
| 146 | 07/21/94 | PDA (INNER) | -09.0 | 4.3 | 125.1 | 129 | 97 | |
| 147 | 07/21/94 | PDA (INNER) | -08.0 | 3.5 | 125.9 | 129 | 98 | |
| 148 | 07/21/94 | PDA (INNER) | -08.0 | 4.3 | 124.5 | 129 | 97 | |
| 149 | 07/21/94 | PDA (INNER) | -08.0 | 4.0 | 128.2 | 129 | 99 | |
| 150 | 07/21/94 | PDA (INNER) | -08.0 | 4.4 | 124.6 | 129 | 97 | |
| 151 | 07/21/94 | PDA (INNER) | -07.0 | 4.4 | 124.9 | 129 | 97 | |
| 152 | 07/21/94 | PDA (INNER) | -07.0 | 6.4 | 130.4 | 129 | 101 | |
| 153 | 07/21/94 | PDA (INNER) | -07.0 | 4.1 | 124.9 | 129 | 97 | |
| 154 | 07/21/94 | PDA (INNER) | -07.0 | 4.5 | 127.3 | 129 | 99 | |
| 155 | 07/21/94 | PDA (INNER) | -06.0 | 4.6 | 123.9 | 129 | 96 | |
| 156 | 07/21/94 | PDA (INNER) | -06.0 | 4.7 | 125.2 | 129 | 97 | |
| 157 | 07/21/94 | PDA (INNER) | -06.0 | 5.7 | 127.0 | 129 | 98 | |
| 158 | 07/21/94 | PDA (INNER) | -06.0 | 4.6 | 122.7 | 129 | 95 | |
| 159 | 07/21/94 | PDA (INNER) | -05.0 | 3.9 | 125.4 | 129 | 97 | |
| 160 | 07/21/94 | PDA (INNER) | -05.0 | 4.5 | 126.2 | 129 | 98 | |
| 161 | 07/21/94 | PDA (INNER) | -05.0 | 3.5 | 126.9 | 129 | 98 | |
| 162 | 07/21/94 | PDA (INNER) | -05.0 | 3.6 | 125.3 | 129 | 97 | |
| 163 | 07/22/94 | PDA (INNER) | -04.0 | 4.0 | 123.9 | 129 | 96 | |
| 164 | 07/22/94 | PDA (INNER) | -04.0 | 3.8 | 125.2 | 129 | 97 | |
| 165 | 07/22/94 | PDA (INNER) | -04.0 | 3.8 | 127.8 | 129 | 99 | |
| 166 | 07/22/94 | PDA (INNER) | -04.0 | 4.3 | 129.1 | 129 | 100 | |
| 167 | 07/22/94 | PDA (INNER) | -03.0 | 3.1 | 123.4 | 129 | 96 | |
| 168 | 07/22/94 | PDA (INNER) | -03.0 | 3.3 | 125.8 | 129 | 98 | |

1. BELOW PLANNED FINISH GRADE
2. ASTM D1557 TEST PROCEDURE

FIELD DENSITY TEST RESULTS
MONSANTO CORPORATION
KEARNY, NEW JERSEY

| TEST
NO | TEST
DATE | AREA | DEPTH ¹
(FEET) | FIELD
MOIST
CONT | FIELD
DRY
DENS. | MAX ²
DRY
DENS. | %
COMP | REMARKS |
|------------|--------------|-------------|------------------------------|------------------------|-----------------------|----------------------------------|-----------|---------|
| 169 | 07/22/94 | PDA (INNER) | -03.0 | 4.3 | 127.1 | 129 | 99 | |
| 170 | 07/22/94 | PDA (INNER) | -03.0 | 4.1 | 125.4 | 129 | 97 | |
| 171 | 07/22/94 | PDA (INNER) | -02.5 | 3.6 | 124.0 | 129 | 96 | |
| 172 | 07/22/94 | PDA (INNER) | -02.5 | 2.6 | 122.6 | 129 | 95 | |
| 173 | 07/22/94 | PDA (INNER) | -02.0 | 4.7 | 129.0 | 129 | 100 | |
| 174 | 07/22/94 | PDA (INNER) | -02.0 | 4.7 | 125.9 | 129 | 98 | |
| 175 | 07/22/94 | PDA (INNER) | -01.5 | 3.8 | 123.5 | 129 | 96 | |
| 176 | 07/22/94 | PDA (INNER) | -01.5 | 4.0 | 128.5 | 129 | 100 | |
| 177 | 07/22/94 | PDA (INNER) | -01.0 | 3.8 | 122.9 | 129 | 95 | |
| 178 | 07/22/94 | PDA (INNER) | -01.0 | 4.4 | 127.8 | 129 | 99 | |
| 179 | 07/22/94 | PDA (INNER) | -00.5 | 4.2 | 129.4 | 129 | 100 | |
| 180 | 07/22/94 | PDA (INNER) | -00.5 | 3.5 | 126.4 | 129 | 98 | |
| 181 | 07/22/94 | PDA (INNER) | 00.0 | 3.6 | 124.5 | 129 | 97 | |
| 182 | 07/22/94 | PDA (INNER) | 00.0 | 3.9 | 128.7 | 129 | 100 | |

1. BELOW PLANNED FINISH GRADE
2. ASTM D1557 TEST PROCEDURE



NAPORANO IRON & METAL COMPANY

P.O. BOX 5158 • NEWARK, N.J. 07105

PRIDE IN PERFORMANCE®

LOCATION:

FOOT OF HAWKINS STREET

4 AUG 09 TIME: 08.20 AM / 08.34 AM

*** CERTIFICATE OF WEIGHT ***

RECEIPT NO: 231154

CLIENT: BARBELLA

5 20320 LBS TARE: 11900 LBS. DEDUCT: 0 LBS (

VEHICLE:

) NET: 8420 LBS / 3.75 GT

| PRODUCT | DESCRIPTION | LBS | GT | PRICE | PER | AMOUNT | LOC |
|---------|-------------|------|------|---------|-----|--------|-----|
| 300 | UPPD P&S | 8420 | 3.75 | 74.0000 | GT | 279.00 | SH |

FREIGHT CHARGE / LOAD
WASTE CHARGE
TOTAL AMOUNT DUE SUPPLIER

\$279.00

CASH PAYMENT RECEIVED BY:

[Signature]



NAPORANO IRON & METAL COMPANY

P.O. BOX 5158 • NEWARK, N.J. 07105

PRIDE IN PERFORMANCE®

LOCATION:

FOOT OF HAWKINS STREET

4 AUG 09 TIME: 10.50 AM / 11.07 AM

*** CERTIFICATE OF WEIGHT ***

RECEIPT NO: 231214

CLIENT: BARBELLA

5 16700 LBS TARE: 11920 LBS. DEDUCT: 0 LBS (

VEHICLE:

) NET: 4780 LBS / 2.13 GT

| PRODUCT | DESCRIPTION | LBS | GT | PRICE | PER | AMOUNT | LOC |
|---------|---------------------|------|------|---------|-----|--------|-----|
| 300 | UPPD P&S | 4749 | 2.13 | 74.0000 | GT | 157.00 | SH |
| 813 | CU, INSULATED CABLE | 32 | 0.1 | 4.0000 | LB | 13.00 | SH |


FREIGHT CHARGE / LOAD
WASTE CHARGE
TOTAL AMOUNT DUE SUPPLIER

\$170.00

CASH PAYMENT RECEIVED BY:

[Signature]

850131685



NAPORANO IRON & METAL COMPANY

P.O. BOX 5158 • NEWARK, N.J. 07105

PRIDE IN PERFORMANCE®

LOCATION:

FOOT OF HAWKINS STREET

94 AUG 08 TIME: 03.26 PM / 03.59 PM

*** CERTIFICATE OF WEIGHT ***

RECEIPT NO: 231136

DR: BARBELLA

VEHICLE:

21200 LBS. TARE: 11760 LBS. DEDUCT: 0 LBS (

), NET: 9440 LBS / 4.21 GT

| PRODUCT DESCRIPTION | LBS | GT | PRICE PER | AMOUNT | LOC |
|---------------------|------|------|------------|--------|-----|
| 300 UPPD P&S | 9440 | 4.21 | 74.0000 GT | 312.00 | SH |

FREIGHT CHARGE / LOAD
WASTE CHARGE
TOTAL AMOUNT DUE SUPPLIER

\$312.00

CASH PAYMENT RECEIVED BY:



NAPORANO IRON & METAL COMPANY

P.O. BOX 5158 • NEWARK, N.J. 07105

PRIDE IN PERFORMANCE®

LOCATION:

FOOT OF HAWKINS STREET

94 AUG 09 TIME: 09.40 AM / 09.54 AM

*** CERTIFICATE OF WEIGHT ***

RECEIPT NO: 231195

DR: BARBELLA

VEHICLE:

20700 LBS. TARE: 11860 LBS. DEDUCT: 0 LBS (

NET: 9840 LBS / 3.95 GT

| PRODUCT DESCRIPTION | LBS | GT | PRICE PER | AMOUNT | LOC |
|---------------------|------|------|------------|--------|-----|
| 300 UPPD P&S | 9840 | 3.95 | 78.0000 GT | 292.00 | SH |

FREIGHT CHARGE / LOAD
WASTE CHARGE
TOTAL AMOUNT DUE SUPPLIER

\$292.00

850131686



FRANK H. LEHR ASSOCIATES
CONSULTING CIVIL ENGINEERS
101 SOUTH HARRISON ST. EAST ORANGE, NJ 07018-1700
201/673-2520
FAX: 201/673-8623

| | | | |
|----------------------------------------|--|--------------------------|--|
| DATE
8/9/94 | | PROJECT NO.
5146 | |
| PROJECT
MONSANTO | | | |
| LOCATION
KEARNY N.J. | | | |
| CONTRACTOR
SPRZ | | OWNER | |
| WEATHER
RAIN | | TEMP. ° 81 AM
° 81 PM | |
| PRESENT AT SITE
HUNTER-WESTINGHOUSE | | | |
| | | | |
| | | | |

FIELD REPORT

THE FOLLOWING WAS NOTED:

WENT TO SITE TO PERFORM FIELD DENSITY TESTS
ON 6" ± THK. Q.P. AS REQUESTED BY
MIMREY.
UPON ARRIVAL Q.P. WAS ALREADY ROLLED
AND TESTS WERE TO BE DONE AT LOCATION
POINT OUT BY ON-SITE ENGINEER.
DUE TO HEAVY RAIN TESTING WAS
CANCELLED AND RESCHEDULED FOR MONDAY
8/14/94.

K. W. Wapont



FRANK H. LEHR ASSOCIATES
CONSULTING CIVIL ENGINEERS
101 SOUTH HARRISON ST., EAST ORANGE, NJ 07016-1799
201-873-4520
FAX: 201-873-0623

| | | |
|------------------------------------|------------------------------------------------|----------------------------|
| DATE
<i>Feb. 8, 1994</i> | | PROJECT NO.
<i>5146</i> |
| PROJECT
<i>Monsieur</i> | | |
| LOCATION
<i>Kearny, NJ</i> | | |
| CONTRACTOR
<i>Sect 2/Wingay</i> | OWNER | |
| WEATHER
<i>Sunny</i> | TEMP. <i>50</i> ° at <i>9:00</i> AM
° at PM | |
| PRESENT AT SITE | | |
| <i>Steve Young - Roux Assoc.</i> | | |
| <i>Gould Hunter Westinghouse</i> | | |

FIELD REPORT

FOLLOWING WAS NOTED:

At site to conduct field density tests on previously placed DGA. Tests were performed at the surface of the DGA at locations selected by Roux Assoc. Informed most of the area was graded and compacted; however while present minor grading was in progress at the northern end. A total of 16 test locations were picked by Steve. Steve asked for tests to be performed around the perimeter, staying 3'-4' off the edge and 4 locations in the center. Maximum density of 137.2 pcf was used based on the material being the same as used on a recent FDOT project. Test results generally were above 95 percent compaction with 2 locations slightly less. Test results and locations were given to Gould Hunter after speaking with Doug of Wingay. Informed approx 6 inches of DGA was placed while present some areas were being recompact with a heavy vibrating roller.

R. Jaeger

850131689

Sheet *1* of *2*



FRANK H. LEHR ASSOCIATES

CONSULTING CIVIL ENGINEERS

101 SOUTH HARRISON ST., EAST ORANGE, NJ 07018-1788

201/673-2520

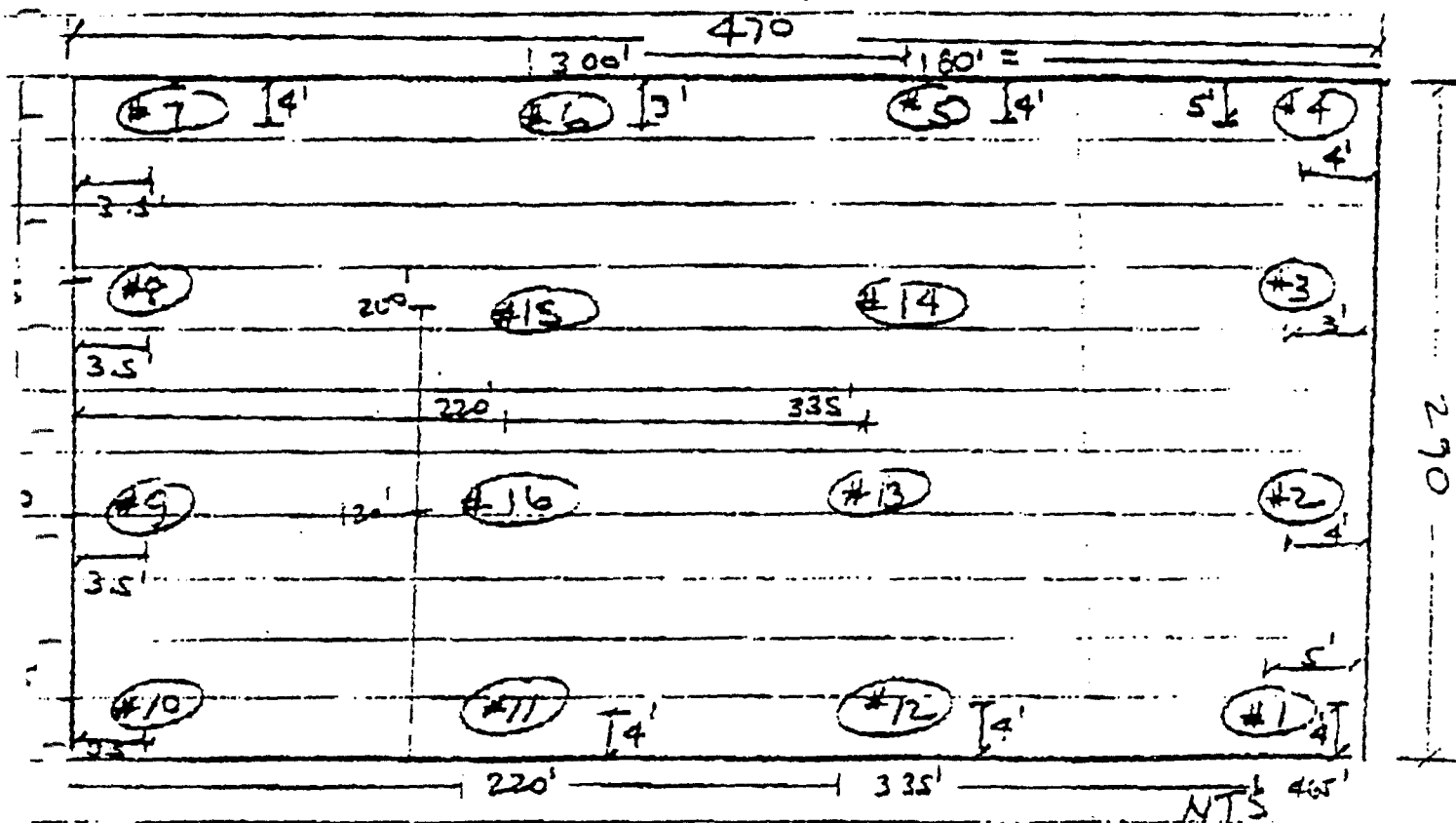
FAX 201/673-6823

| | | | |
|----------------------------|--|-------------------------|--|
| DATE <u>2/2/94 m.w.</u> | | PROJECT NO. <u>SJ46</u> | |
| PROJECT <u>MONSANTO</u> | | | |
| LOCATION <u>Kearny, NJ</u> | | | |
| CONTRACTOR | | OWNER | |
| WEATHER | | TEMP ° at AM
° at PM | |
| PRESENT AT SITE | | | |
| | | | |
| | | | |
| | | | |

FIELD REPORT

FOLLOWING WAS NOTED:

Approx. Location of Field Density Tests



To Penn. Ave.

R. Gosh

850131690

Sheet 2 of 2

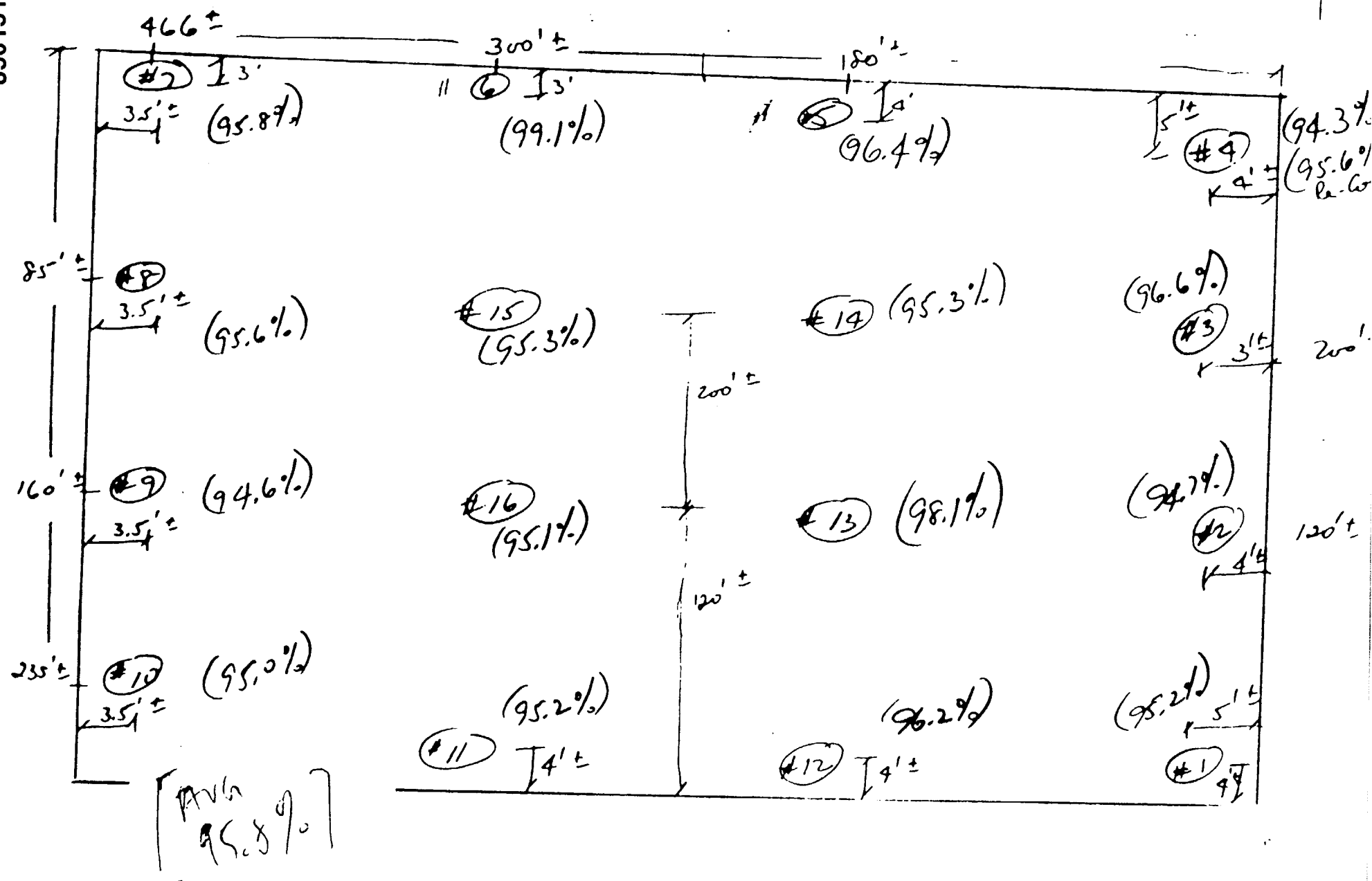
FIELD DENSITY TEST SUMMARY SHEET

PROJECT: MONSANTOLOCATION: KEARNY, NJPROJECT NO: S146INSPECTOR: RASPAGE NO: 1

| DATE | TEST NO. | LOCATION OF TEST | TOTAL FILL REQ'D | LIFT NO. | ELEV. | TEST DRY DENSITY (pcf) | MAX. DRY DENSITY (pcf) | % COMP. | % COMP. REQ'D | REMARKS |
|--------|----------|------------------|------------------|----------|-------|------------------------|------------------------|---------|---------------|------------------------|
| 8/8/94 | 1 | #7 | | SG | | 131.4 | 139.2 | 95.8 | 95.0 | See sketch for |
| | 2 | #8 | | | | 131.2 | | 95.6 | | location |
| | 3 | #9 | | | | 129.8 | | 94.6 | | |
| | 4 | #10 | | | | 130.4 | | 95.0 | | |
| | 5 | #11 | | | | 130.6 | | 95.2 | | |
| | 6 | #12 | | | | 132.0 | | 96.2 | | |
| | 7 | #1 | | | | 130.6 | | 95.2 | | |
| | 8 | #2 | | | | 129.9 | | 94.7 | | |
| | 9 | #3 | | | | 132.5 | | 96.6 | | |
| | 10 | #4 | | | | 129.4 | | 94.3 | | Area being graded |
| | 11 | #5 | | | | 132.2 | | 96.4 | | |
| | 12 | #6 | | | | 135.9 | | 99.1 | | |
| | 13 | #16 | | | | 130.5 | | 95.1 | | |
| | 14 | #15 | | | | 130.8 | | 95.3 | | |
| | 15 | #13 | | | | 134.6 | | 98.1 | | |
| | 16 | #14 | | | | 130.8 | | 95.3 | | |
| | 17 | #4 | | | | 131.2 | | 95.6 | | Retest after Regrading |

850131691

8/8/9





WIMPEY MINERALS USA, INC.

October 4, 1994

Westinghouse Remediation Services, Inc.
225 Business Center Drive, Suite "A"
Horsham, PA 19044

RE: Monsanto Remediation Project, Kearny, NJ

Attention: Gould Hunter

Dear Mr. Hunter:

This project consisted of approximately 15,000 square yards of NJDOT specification I-2 stabilized base mix and 15,000 square yards of NJDOT specification I-5 surface course mix. In place air void testing was performed utilizing a calibrated Troxler asphalt nuclear density gauge Model 4640B.

The following are air void determinations at fifteen (15) randomly selected locations on the I-2 base pavement and the I-5 surface pavement.

Percent Voids Total Mix

I-2 Base Course

4.1
5.6
3.9
6.7
5.9

6.2
5.7
3.1
5.3
4.9

I-5 Surface Course

5.4
4.6
6.2
3.8
4.9

4.4
3.6
5.8
6.1
5.7

Percent Voids Total Mix

I-2 Base Course

3.4
5.2
4.8
6.9
5.7

I-5 Surface Course

5.1
5.7
4.2
6.8
4.0

If you require any additional information, please do not hesitate to contact me.

Respectfully,



Kenneth Zadora, P.A.T.
Quality Control & Material

cc: Steve Young - Roux Assoc., Inc.

FAX - 215-699-1247

KZ/cp

850131694



FRANK H. LEHR ASSOCIATES
CONSULTING CIVIL ENGINEERS

August 10, 1994

Wimpey Minerals, USA
311 West Main Street
Rockaway, NJ 07886

ATT: Mr. Doug Barry

RE: Project No. 5146
Report of Field Density Testing
Monsanto
Kearny, New Jersey

Gentlemen:

In accordance with your request, a representative from this office was present at the Monsanto project in Kearny, New Jersey, to conduct field density tests on Dense Graded Aggregate base course. This work was performed on August 5 and 8, 1994.

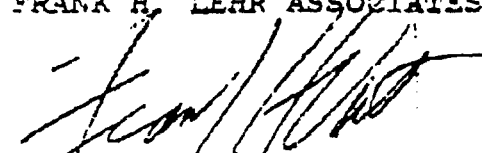
Field density tests were performed on the surface of previously placed DGA. Test locations were selected by the Roux Associates field representative. Test results were reported in the field to Roux Associates and Westinghouse Associates representatives. Results were reported via telephone to Wimpey Minerals.

Included with this report are the Inspector's Field Reports and the field density test results.

If you have any questions, or if we can be of further service, please contact our office.

Very truly yours,

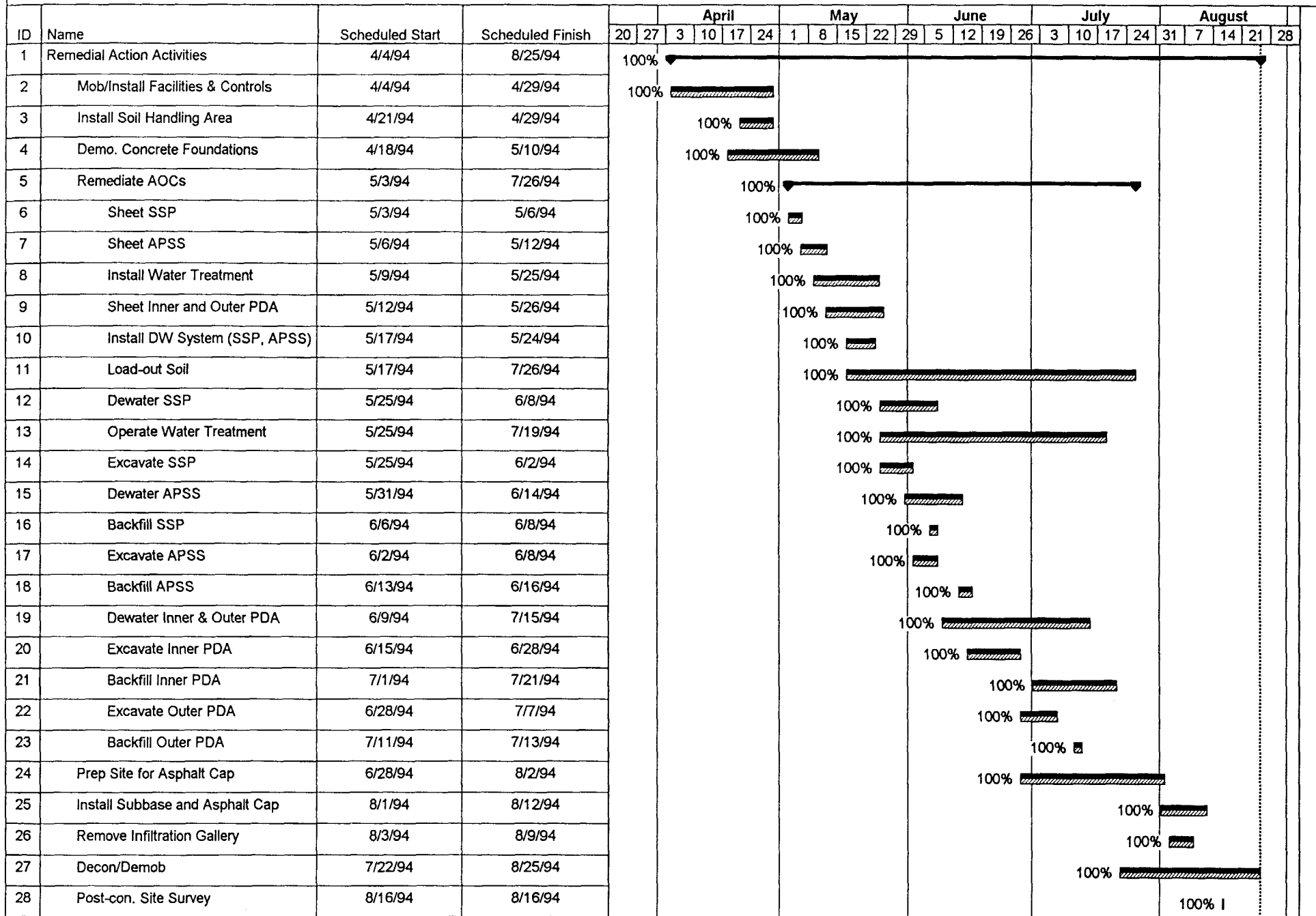
FRANK H. LEHR ASSOCIATES


Frank H. Veit, PE
NJ License No. 20048

R.JOSEPH/maf:a

850131695

REMEDIAL ACTION SCHEDULE, MONSANTO KEARNY PLANT



Project: 06634J
Date: 8/25/94 9:30 am

Progress Summary Scheduled

850131697

This Indenture, MADE THE

day of October in the year of our Lord one thousand nine hundred and fifty-four, (1954)

Between THE UNITED NEW JERSEY RAILROAD AND CANAL COMPANY, a Corporation of the State of New Jersey, hereinafter called party of the first part, _____ and _____

MONSANTO CHEMICAL COMPANY, a Corporation of the State of Delaware, authorized to do business in the State of New Jersey, having its principal office or place of business in St. Louis, Missouri, hereinafter called party of the second part: _____

Witnesseth, that the said party of the first part as well for other good and valuable considerations as _____

_____ for and in consideration of the sum of \$1.00 _____ lawful money of the United States of America, unto it _____ well and truly paid by the said party of the second part _____

at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, has _____ granted, bargained, sold, released and conveyed and by these presents does _____

| | | | | | | | | |
|-----------|-------|----------|---------|----------|------------|---------|----------|--------|
| INST. NO. | 57065 | CO. BUCK | ENTERED | BL. PAGE | BLK. INDEX | INDEXED | COMPARED | MAILED |
| | | | | | | | | |

RECORDED
REGISTER'S OFFICE
HUDSON COUNTY
JERSEY CITY
WILLIAM L. JOHNSON
REGISTER
DEC 9 AM 9:20

grant, bargain, sell, release and convey unto the said party of the second part, its successors and assigns, SUBJECT as hereinafter mentioned, _____

ALL THAT PARCEL of land, with the buildings and improvements thereon erected, situate, lying and being in the Town of Kearny, County of Hudson and State of New Jersey: _____

BEGINNING at a point in the northerly side line of Pennsylvania Avenue (80 feet wide) where same is intersected by the westerly line of an easement to Public Service Electric and Gas Company which is presently used for that Company's Kearny-Athenia Transmission line, said beginning point being located 96.06 feet westerly along said side line of Pennsylvania Avenue from its intersection with the easterly side line of Jacobus Avenue or extension thereof and 50 feet measured at a right angle from the center line of said easement; and running from thence (1) North 80 degrees 48 minutes west along said northerly side line of Pennsylvania Avenue 150 feet to a point; thence (2) North 9 degrees 12 minutes east at right angles to Pennsylvania Avenue and along remaining lands of The United New Jersey Railroad and Canal Company 112.50 feet to a point; thence (3) North 80 degrees 48 minutes west parallel to Pennsylvania Avenue and still along said United New Jersey Railroad and Canal Company lands 972.38 feet to a point; thence (4) South 9 degrees 12 minutes west at right angles to the third course above and still along said United New Jersey Railroad and Canal Company lands 112.50 feet to the northerly side line of Pennsylvania Avenue; thence (5) North 80 degrees

2006 MAR 4 25

48 minutes west along said side line 673.49 feet to an angle in same; thence (6) Still along the northwesterly terminus of Pennsylvania Avenue south 43 degrees 52 minutes 30 seconds west 93.30 feet to the pierhead and bulkhead line of the Passaic River; thence (7) North 22 degrees 33 minutes 33 seconds west along said pierhead and bulkhead line 121.50 feet to an angle in same; thence (8) Still along the same north 47 degrees 04 minutes 25 seconds west 785.63 feet to a point at the intersection of the northwesterly line of a riparian grant recorded in Book 983 of Deeds of Hudson County, Page 593; thence along remaining lands of The United New Jersey Railroad and Canal Company the following five courses and distances: (9) North 55 degrees 40 minutes 32 seconds east 199.70 feet; thence (10) South 87 degrees 10 minutes 43 seconds east 495.33 feet to a point distant 50 feet southerly from the center line of a railroad track known as the Grape Yard Lead if measured at right angles thereto; thence (11) South 77 degrees 21 minutes 52 seconds east 504.26 feet to another point distant 50 feet southerly from said track center line measured at right angles thereto; thence (12) South 76 degrees 12 minutes 50 seconds east 307.45 feet to a point distant 20 feet southerly from said track center line measured at right angles; thence (13) South 70 degrees 2 minutes east 1,115.24 feet to the westerly line of the aforementioned easement to Public Service Electric and Gas Company; thence (14) South 3 degrees 27 minutes 5 seconds east along the westerly line of said easement 141.71 feet to an angle in same; thence (15) South 10 degrees 10 minutes 40 seconds west and still along the westerly line of said easement 249.86 feet to the northerly side line of Pennsylvania Avenue and point and place of beginning.

CONTAINING 27.01455 acres.

The foregoing description being according to a survey made by Arthur Brokaw, Civil Engineer and land surveyor, Kearny, New Jersey, entitled "Map of Property situated in the Town of Kearny, Hudson County, New Jersey" dated August 12, 1954, revised September 15, 1954, and bearing Brokaw's survey number 54-109.

The parcel of land hereinbefore described being comprised of (1) part of the premises title to which became vested in The United New Jersey Railroad and Canal Company, the party of the first part herein, in fee, under and by virtue of the two following Deeds: ONE DEED from Manor Berl Estate and Trust Company dated February 20, 1923 and recorded in the Office of the Register of Hudson County, New Jersey in Book 1474 of Deeds at Page 276, subject, however, to the provisions, conditions, reservations and covenants as set forth in the Riparian Grant from the State of New Jersey to Harry C. Trexler dated June 8, 1907 and recorded as aforesaid in Book 1029 of Deeds at Page 633; AND THE OTHER DEED from Hackensack Meadows Company dated September 14, 1905 and recorded as aforesaid in Book 983 of Deeds at Page 563; and (2) part of the premises which the State of New Jersey by Riparian Grant dated June 6, 1907 and recorded as aforesaid in Book 983 of Deeds at Page 593, granted and conveyed, unto said The United New Jersey Railroad and Canal Company.

REF ID: A62606

as well as law as in equity,

or otherwise howsoever, of, in and to the same and every part thereof.

RESERVING, however, unto the said party of the first part, its successors and assigns, (1) the existing water line of varying dimensions extending across the parcel of land hereinbefore described and facilities appurtenant thereto, together with the right to use, maintain and reconstruct the same; provided, however, that the said party of the second part, its successors or assigns, shall have the right to relocate said line on the parcel of land hereinbefore described at its or their own cost and expense; (2) the right to cross the parcel of land hereinbefore described by means of a private roadway, so long as required by the party of the first part, at a location to be designated by the said party of the second part, its successors or assigns, as a means of access to its remaining property along the Passaic River and west of the parcel of land hereinbefore described, which private roadway may be relocated by the party of the second part, its successors and assigns, from time to time and upon any such relocation all rights in any pre-existing location shall cease and terminate; and (3) the right to cross said land at the southeast corner thereof with two railroad tracks and appurtenant facilities to serve adjoining land on the south, which adjoining land is bounded on the south by the northerly line of Pennsylvania Avenue and on the east, north and west by the premises herein conveyed, until such time as the said adjoining land may be conveyed to the said party of the second part, its successors or assigns.

We have and do hereby grant, the premises hereby granted, or mentioned and intended so to be,

with the appurtenances.

unto the said party of the second part, its successors

and assigns, to and for the only proper use and behoof of the said party of the second part, its successors _____ and assigns, forever.

RESERVING as aforesaid.

SUBJECT, however, to (1) the rights of the City of Bayonne to operate and maintain a concrete tunnel carrying two 30 inch cast iron water pipes over and across but beneath the surface of said land, under and by virtue of an Instrument with The Pennsylvania Railroad Company, Lessee of The United New Jersey Railroad and Canal Company, dated July 29, 1920; (2) the terms, conditions and limitations as more particularly set forth in the Riparian Grant from the State of New Jersey to The United New Jersey Railroad and Canal Company, dated June 6, 1907, hereinbefore recited; (3) the provisions, conditions, reservations and covenants as more particularly set forth in the Riparian Grant from the State of New Jersey to Harry C. Trexler dated June 8, 1909 and recorded in the Office of the Register of Hudson County, New Jersey, in Book 1029 of Deeds at Page 633; (4) the rights of The New York and New Jersey Water Company to operate and maintain its existing water pipes over and across but beneath the surface of said land, under and by virtue of an Instrument from Ellen M.

2606 427

Pike et al dated April 20, 1896 and recorded as aforesaid in Book 645 of Deeds at Page 347; and (5) the rights of The New York and New Jersey Water Company to operate and maintain its existing water pipes over and across but beneath the surface of said land, under and by virtue of an Instrument from Harry C. Trexler and Fred H. Sterner, doing business as Trexler Lumber Company dated July 29, 1918 and recorded as aforesaid in Book 1289 of Deeds at Page 119.

THIS INSTRUMENT is executed, delivered and accepted, however, upon the understanding and agreement: (1) that neither the said party of the first part, nor its successors or assigns, shall be liable or obliged to construct or maintain any fence between the land heretofore described and land of the said party of the first part adjoining the same; or be liable or obliged to pay for any part of the cost or expense of constructing or maintaining such a fence or any part thereof; or be liable for compensation for any damage to party of the second part, its employes or representatives, successors or assigns that may result by reason of the non-existence of such a fence; and (2) that neither the party of the second part nor its successors or assigns, shall have, or assert to have, any claims or demands, whatever, for compensation for damages to the parcel of land heretofore described, or to any buildings or improvements now or hereafter erected thereon or to the contents thereof, which may be caused by the sliding of slopes or any part of the adjoining railroad embankment of the said party of the first part or by the drainage or seepage of water from the adjoining land of the party of the first part, its successors or assigns.

2606 MAR 428

And the said party of the first part, for itself and its successors

As to by

these presents, covenant, grant and agree, to and with the said party of the second part, its successors

and assigns, that — it — the said party of the first part, and its successors

all and singular the hereditaments and premises hereinbefore described and granted, or mentioned and intended so to be, with the appurtenances, unto the said party of the second part, its successors

and assigns, against — it — the said party of the first part, and its successors

and against all and every Person or Persons whomsoever lawfully claiming or to claim the same or any part thereof, by, from or under it, them or any of them,

shall and will, SUBJECT and RESERVING as aforesaid, WARRANT and forever DEFEND.

IN WITNESS WHEREOF, the said party of the first part has caused its common or corporate seal to be hereunto affixed, duly attested, and these presents to be executed on its behalf by its Vice-President, the day and year first above written.

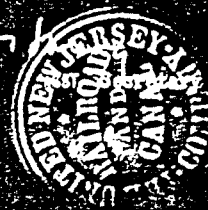
THE UNITED NEW JERSEY RAILROAD AND CANAL COMPANY

By:

David C. Devan
DAVID C. DEVAN
Vice-President

Attest:

W. A. HARRING



2696 429

STATE OF

County, ss.

Be it Remembered That on this day of in the year our Lord one thousand nine hundred and before me,

personally appeared

who, I am satisfied, the grantor mentioned in and who executed the within Deed, and I having first made known to the contents thereof, acknowledged that signed, sealed and delivered the same as voluntary act and deed. All of which is hereby certified.

COMMONWEALTH OF PENNSYLVANIA
STATE OF
PHILADELPHIA County, ss.

Be it Remembered That on this 14 day of October in the year of our Lord one thousand nine hundred and fifty-four (1954), before me, a Notary Public for the Commonwealth and County aforesaid,

who being duly sworn, on his oath said that he is Secretary of THE UNITED NEW JERSEY RAILROAD AND CANAL COMPANY,

that he is duly sworn, and that DAVID G. SEWAN is the Vice-President, that deponent knows the common or corporate seal of said grantor and that the seal annexed to the within Deed or Conveyance is such common or corporate seal; that the said Deed or Conveyance was signed by the said Vice-President and the seal of said grantor affixed thereto in the presence of deponent; that said Deed or Conveyance was signed, sealed and delivered as and for the voluntary act and deed of said grantor for the uses and purposes therein expressed; pursuant to a resolution of the Board of Directors of said grantor; and at the execution thereof this deponent subscribed his name thereto as witness.

Witness my hand and subscribed before me the day and year aforesaid

James E. Barton
Notary Public
PHILADELPHIA, PHILADELPHIA CO., PA.
My Commission Expires: JUNE 24, 1958

W.A. Haring
Asst. Secretary
W.A. HARING

2606 430

KNOW ALL MEN BY THESE PRESENTS

That THE PENNSYLVANIA RAILROAD COMPANY, Lessee of The United New Jersey Railroad and Canal Company, under Indenture of Lease with the companies commonly called the United Canal and Railroad Companies of New Jersey (since consolidated under the corporate name of The United New Jersey Railroad and Canal Company) dated June 30th, 1871, for the term of nine hundred and ninety-nine years from June 30th, 1871, does, for and in consideration of the sum of One Dollar to it paid, hereby consent and agree to the conveyance of the premises described in the foregoing and attached Deed from The United New Jersey Railroad and Canal Company to MONSANTO CHEMICAL COMPANY

dated *October 14*, 1954, and does hereby remise, release and forever quit-claim to MONSANTO CHEMICAL COMPANY, its successors and assigns, the premises described therein.

IN WITNESS WHEREOF, the said The Pennsylvania Railroad Company has caused its corporate seal to be hereunto affixed, duly attested and this Release to be signed by its Vice-President, this *14* day of *October*, A. D. one thousand nine hundred and fifty-four (1954).

THE PENNSYLVANIA RAILROAD COMPANY,
By,

J. B. Jones
Vice-President.
T. B. JONES
G. C. Johnson, Jr.
ASST. Secretary.
G. C. JOHNSON, JR.

COMMONWEALTH OF PENNSYLVANIA)
: ss.
COUNTY OF PHILADELPHIA)

BE IT REMEMBERED, That on this *14* day of *October*, A. D. 1954, before me, a Notary Public for the Commonwealth and County aforesaid,

personally appeared G. C. JOHNSON, JR., who being by me duly sworn according to law, on his oath saith that he is ASST. Secretary of The Pennsylvania Railroad Company, the Releasor named in the above Release, that he knows the seal of the said Company, and that the seal affixed to the said Release is the common or corporate seal of the said Company; that *J. B. JONES* is the Vice-President of the said Company; that this deponent saw the said J. B. JONES sign, seal and deliver the said Release as the voluntary act and deed of the said Company for the uses and purposes therein expressed, he being thereunto duly authorized by a resolution of the Board of Directors of the said Company, and that at the execution thereof this deponent signed his name to the same as an attesting witness.

Sworn and Subscribed to before me)
the day and year aforesaid.

James E. Barton
Notary Public
PHILADELPHIA, PHILADELPHIA
My Commission Expires: *June 30, 1955*
NOTARY PUBLIC

G. C. Johnson, Jr.
ASST. Secretary
G. C. JOHNSON, JR.

850131705

12014

REGISTER'S OFFICE
HUDSON COUNTY, N. J.

Certified Copy of

DEED

THE UNITED NEW JERSEY RAILROAD & CANAL COMPANY

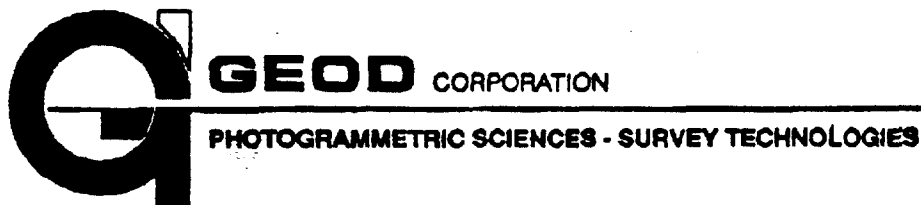
TO

MONSANTO CHEMICAL COMPANY

Fees, : \$

12.00

850131706



METES AND BOUNDS DESCRIPTION

for Asphalt Cap
Block 284 Lot 49
Kearny, Hudson County, New Jersey

ALL OF THAT CERTAIN LOT, TRACT OR PARCEL OF LAND, SITUATED IN THE TOWN OF KEARNY, COUNTY OF HUDSON, STATE OF NEW JERSEY AND BEING FURTHER DESCRIBED AS FOLLOWS:

Beginning at a point being the following two courses from the Northeasterly corner of an existing warehouse situated on Lot 49, Block 284, the New Jersey State Plane Coordinates of the said Northeasterly corner are N 695,544.507, E 2,152,346.767 and the Northwesterly corner of said warehouse are N 695,549.606, E 2,152,155.986:

- A. S 88°-28'-08" E along the prolongation of the existing warehouse, a distance of 36.40 feet to a point; thence,
- B. N 1°-31'-52" E, a distance of 54.26 feet to the point beginning; and proceeding;
 - 1. N 88°-08'-07" W, a distance of 469.23 feet to a point; thence,
 - 2. N 1°-47'-25" E, a distance of 288.67 feet to a point; thence,
 - 3. S 88°-18'-44" E, a distance of 469.37 feet to a point; thence,
 - 4. S 1°-49'-00" W, a distance of 290.12 feet to the point and place of beginning.

Containing 135,811 square feet of land more or less.

Being the asphalt cap as shown on "Post-Remedial Action Plan Showing Topography at Asphalt Cap, Monsanto-Kearny Site", prepared for Roux Associates, Inc., Monsanto Company by GEOD Corporation, dated August 18, 1994.

DATE: October 27, 1994

850131707

32.leg

EXHIBIT B

DESCRIPTION OF THE "AFFECTED AREA"

**SITE PLAN SHOWING THE LOCATION OF THE
"AFFECTED AREA" AND ENGINEERING CONTROL (FIGURE B-1)**

ASPHALT CAP SECTION (FIGURE B-2)

**LOCATION OF REMAINING SURFACE AND
SUBSURFACE SOIL EXCEEDANCES ABOVE CURRENT
NON-RESIDENTIAL CLEANUP CRITERIA (FIGURE B-3)**

DESCRIPTION OF THE AFFECTED AREA

Administrative Consent Order Docket Number C-17649-88

Former Monsanto Company Kearny Plant

Block 284, Lot 49

Kearny, Hudson County, New Jersey

The New Jersey Department of Environmental Protection (Department) has provided approval to obtain a *Declaration of Environmental Restrictions* (DER) for the "Affected Area", pursuant to the New Jersey Industrial Site Recovery Act (ISRA), P.L. 1993, c. 139. The following presents a description of the "Affected Area" and indicates the procedures used to define the boundaries of the "Affected Area". Additional information regarding this case may be obtained by reviewing Department files.

Description of Affected Area

The "Affected Area" or asphalt capped area is located near the center of Lot 49, Block 284 as shown on Figure B-1. The size of the "Affected Area" is estimated to be approximately 135,811 square feet. An asphalt cap cross-section is shown as Figure B-2. The metes and bounds of the "Affected Area" or asphalt capped area have been prepared by a New Jersey-licensed land surveyor, GEOD Corp., and a description of that area is presented in Exhibit A.

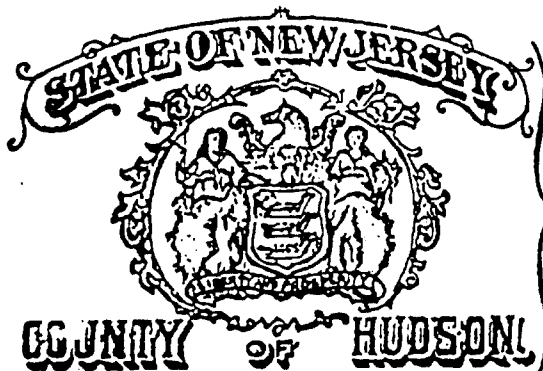
Surface and subsurface soil analytical results have indicated that some exceedances of the Department's non-residential Soil Cleanup Criteria (proposed N.J.A.C. 7:26D, last revised February 3, 1994) remain beneath the "Affected Area" following the completion of recent remedial activities. The following compounds that were detected at levels exceeding Department guidance criteria include:

- Polychlorinated biphenyls (PCBs)
- Arsenic
- Beryllium
- Indeno(1,2,3-cd)pyrene
- Benzo(a)pyrene
- Benzo(a)anthracene
- Benzo(k)fluoranthene

Each surface and subsurface sampling location within the affected area which had observed an exceedance of soil cleanup criteria and was not removed during recent remedial activities has been provided as Figure B-3. This figure has been prepared to present the location of each exceedance in relation to the "Affected Area." Surface sampling results were compared to non-residential direct contact soil cleanup criteria, while subsurface sampling results were compared to impact to ground water soil cleanup criteria.

Current Use

Presently, the site is located in an area zoned for commercial and industrial activities. The operating portions of the site, including the portion of the property containing the "Affected Area", are surrounded by existing six-foot high chain link fence. The site is currently proposed to be used as a trucking facility.



§
J,

KENNETH C. CHMIELEWSKI

Register of the County of Hudson,

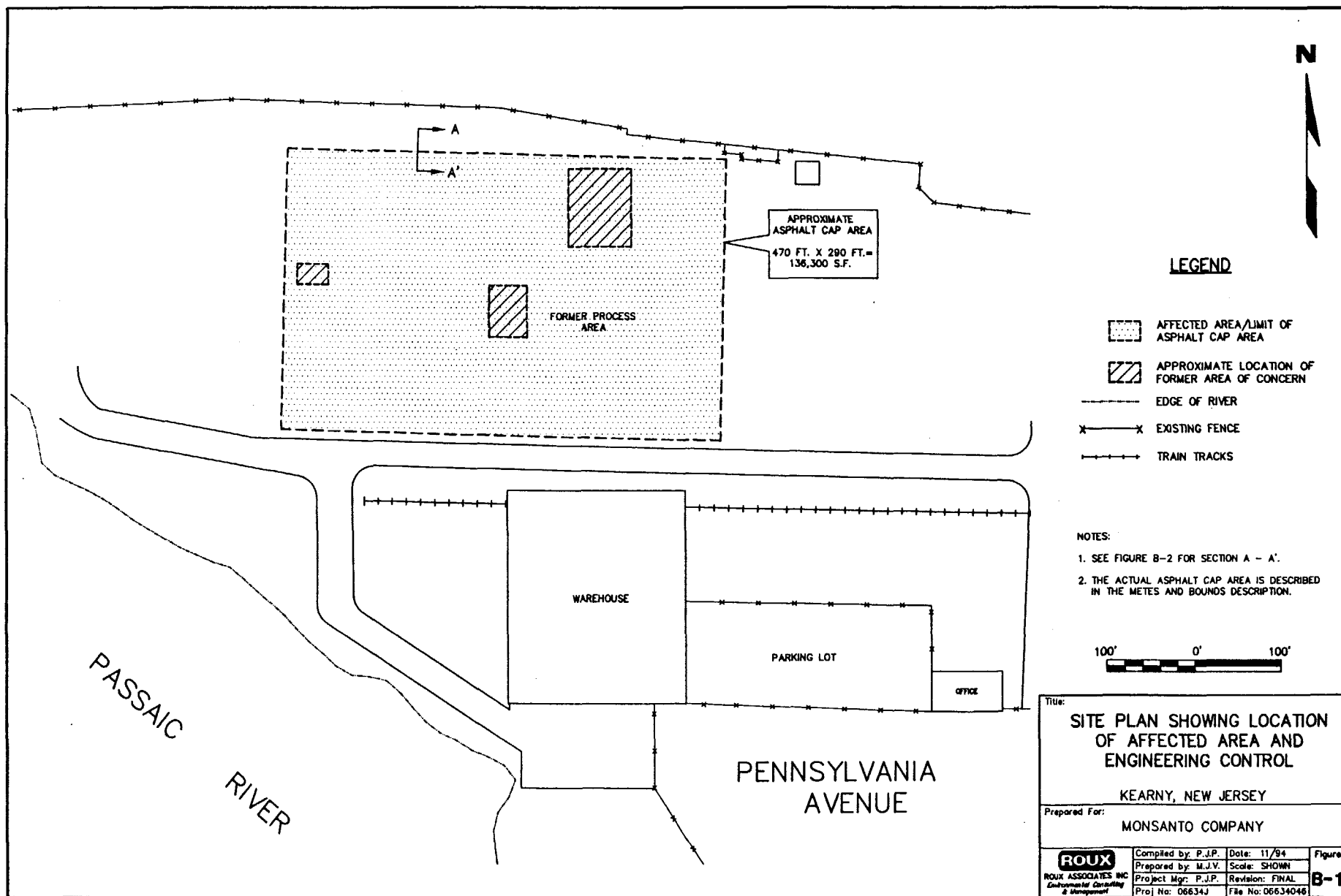
do hereby Certify that the foregoing is a true and
correct copy of a certain DEED
as the same is on record in my Office in Book 2606
of DEED on Page 424 Etc.



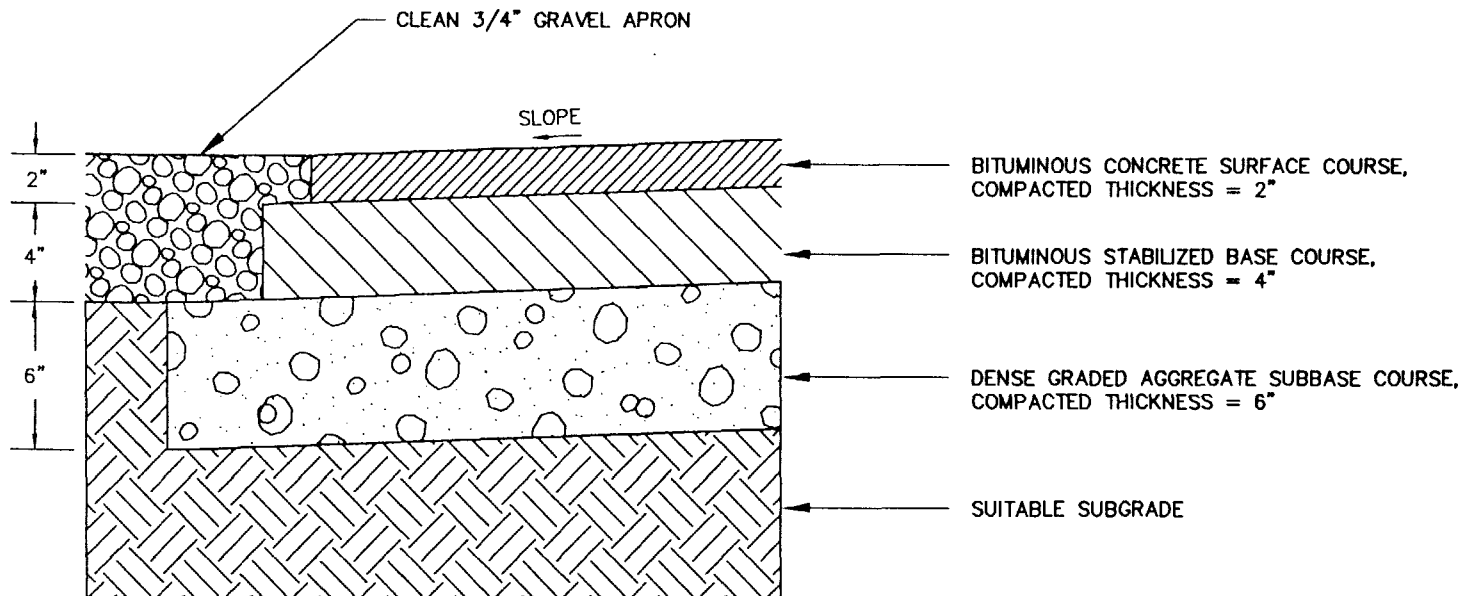
Witness my hand and seal of Office, the
24th day of OCTOBER
in the year of our Lord, One thousand, nine
hundred and 1994

Kenneth C. Chmielewski

Register



850131711



NOTES:

1. GENERAL: MATERIALS AND MIXTURES COMPLIED WITH SECTION 304 AND SECTION 404 OF THE NEW JERSEY STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS.

BITUMINOUS CONCRETE SURFACE COURSE
MIXTURE: MIX NO. 1-5, TABLE 903-1

BITUMINOUS STABILIZED BASE COURSE
MIXTURE: MIX NO. 1-2, STONE MIX, TABLE 903-1

Title:

ASPHALT CAP SECTION A - A'

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

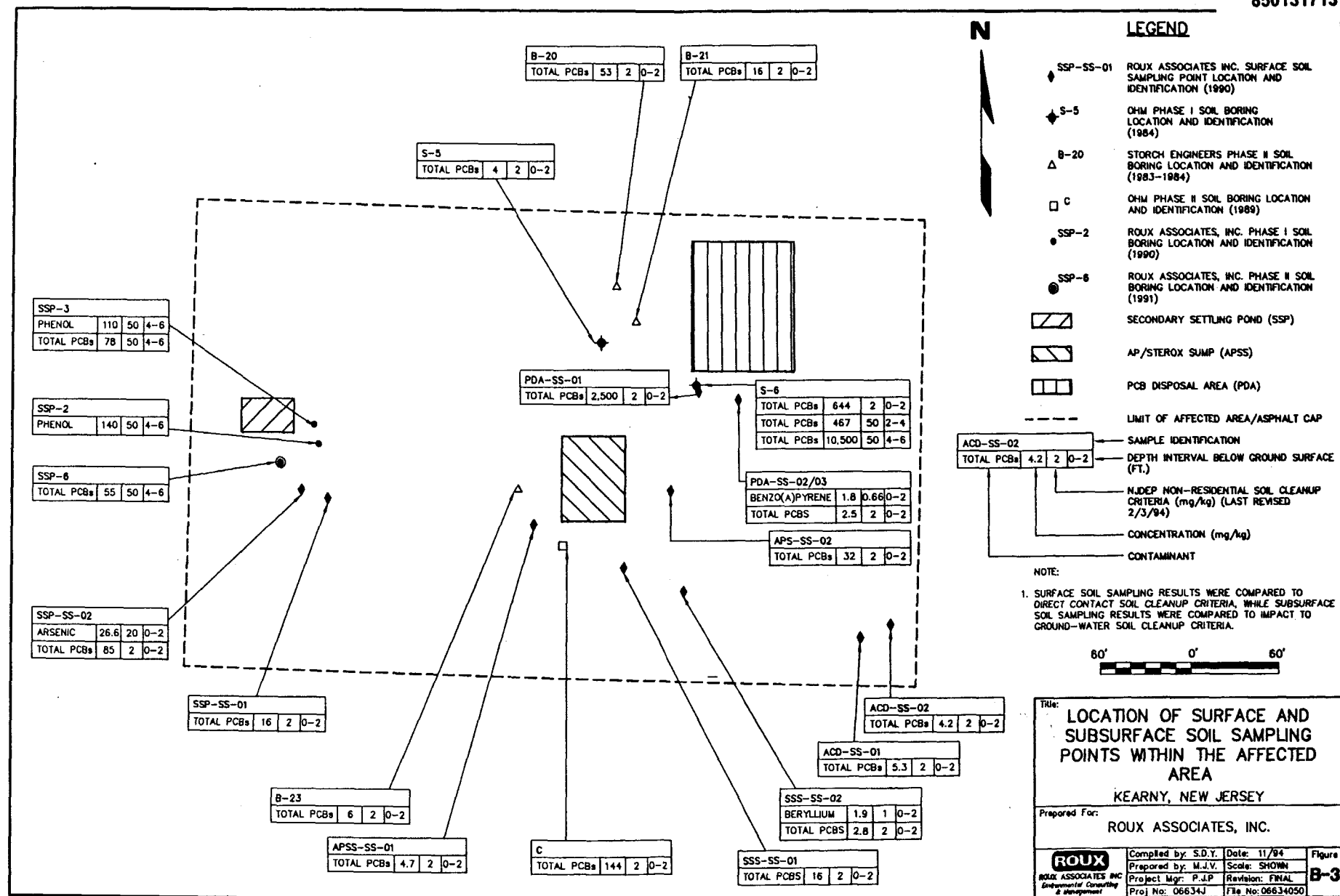
ROUX
ROUX ASSOCIATES INC
Environmental Consulting
& Management

| | |
|---------------------|-------------------|
| Compiled by: P.J.P. | Date: 11/94 |
| Prepared by: M.J.V. | Scale: N.T.S. |
| Project Mgr: P.J.P. | Revision: FINAL |
| Proj No: 06634J | File No: 06634040 |

Figure

B-2

850131712



Register of Deeds
November 11, 1994
Page 2

Exhibit A:

- Site Location Map (Figure A-1);
- Site Plan with Lot and Block designations (Figure A-2);
- Metes and Bounds Description for the subject property, as it is currently recorded with the Hudson County Register;
- Metes and Bounds Description for the "Affected Area".

Exhibit B:

- Description of the "Affected Area";
- Site Plan showing the location of the "Affected Area" and Engineering Control (asphalt cap) (Figure B-1);
- Asphalt Cap Cross-Section (Figure B-2).
- Location of remaining soil exceedances above current non-residential soil cleanup criteria within the "Affected Area" (Figure B-3).

Please provide documentation confirming that the recording of the deed notice has been completed. The confirmatory documents will then be forwarded to the Department by our office.

If you have any questions or comments regarding this matter, please feel free to contact me at (609) 423-8800.

Respectfully submitted,

Peter J. Palko
Senior Engineer/Project Manager

Enclosures

cc: Glenn Savary - New Jersey Department of Environmental Protection
Town Clerk - Town of Kearny, New Jersey
Jeffrey D. Felder, P.E. - Monsanto Company
John R. Loper, P.E. - Roux Associates, Inc.

ATTACHMENT 1

DECLARATION OF ENVIRONMENTAL RESTRICTION

DECLARATION OF ENVIRONMENTAL RESTRICTIONS

Prepared by: _____

[Signature]

[Print Name Below Signature]

This Declaration of Environmental Restrictions, made as of the _____ by Monsanto Company, 800 North Lindbergh Boulevard, St. Louis, Missouri 63167 (together with his/her/its/their successors and assigns, collectively "Owner").

W I T N E S S E T H:

WHEREAS, Owner is the owner in fee simple of certain real property (the "Property") designated as Lot 49, Block 284 on the tax map of the Town of Kearny, Hudson County, more particularly described on Exhibit A attached hereto and made a part hereof; and

WHEREAS, the New Jersey Department of Environmental Protection ("Department") has issued a remedial approval on March 28, 1994, in Administrative Consent Order Docket Number C-17649-88/Monsanto Company, Kearny Plant concerning the Property in which the Department has approved the use of non-residential soil standards, institutional controls, and/or engineering controls in accordance with P.L. 1993 c. 139 (S-1070); and

WHEREAS, this Declaration itself is not intended to create any interest in real estate in favor of the Department, nor to create a lien or encumbrance against the Property, but merely is intended to reflect the regulatory and statutory obligations imposed as a condition of using non-residential standards; and

WHEREAS, the areas described on Exhibit B attached hereto and made a part hereof (the "Affected Areas") contain contaminants;

WHEREAS, the type, concentration and specific location of the contaminants are described on one or more diagrams, maps and/or tables on Exhibit B attached hereto and made a part hereof; and

WHEREAS, to prevent the potential for migration of the contaminants and unacceptable risk of exposure to the contamination to humans or the environment, an impermeable surface cover is in place at the Property, at the location shown on Exhibit B; and

WHEREAS, in accordance with the remedial approval, and in consideration of the terms and conditions of the remedial approval, and other good and valuable consideration Owner has agreed to subject the property to certain statutory and regulatory requirements which impose restrictions upon the use of the Property, and to restrict certain activities at the Property, as set forth below; and

WHEREAS, Owner intends to notify all interested parties that such regulatory and statutory restrictions shall be binding upon and enforceable against Owner and Owner's successors and assigns while such own and/or operate at the Property.

850131716

NOW, THEREFORE, Owner agrees to be subject to the regulatory and statutory requirements applicable to those who seek to remediate property to non-residential standards and hereby notifies all interested parties, Owners, and operators that the applicable regulations and statutes require of Owner and operators while owning or operating the Property as follows:

1. Restricted Uses. Owner, and all Operators of such portions of the Property, shall not allow any of the following uses of the following portions of the Property:

Portion of the Property

Restricted Uses

The Affected Areas as identified in Exhibit B.

The use shall be restricted pursuant to Paragraphs 2 and 3.

2. Emergencies. In the event of an emergency which presents a significant risk to human health, safety, or the environment, the application of Paragraph 1 above may be unilaterally suspended, by Owner, provided the Owner:

- i. Immediately notifies the Department of the emergency;
- ii. Limits both the actual disturbance and the time needed for the disturbance to the minimum reasonably necessary to adequately respond to the emergency;
- iii. Implements all measures necessary to limit actual or potential, present or future risk of exposure to the residual contamination to humans or the environment; and
- iv. Implements restoration of the Affected Areas to the pre-emergency conditions to the extent reasonably possible, and provides a report to the Department of such emergency efforts.

3. Alterations, Improvements, and Disturbances. Owner and operators shall not make, nor allow to be made, any alteration, improvement, or disturbance in, to, or about the Affected Areas which creates an unacceptable risk of exposure to contamination in the Affected Areas to humans or the environment, or results in a disturbance of any engineering control designed to contain or reduce exposure to the contaminants, without first obtaining the express written consent of the Department, which consent shall be given or withheld at the reasonable discretion of Department. Nothing herein shall constitute a waiver of the Owners obligation to comply with all applicable laws and regulations.

Express written consent of the Department is not required for alteration, improvement, or disturbance that meets the following:

- provides for restoration of any disturbance of an engineering control to pre-disturbance conditions within sixty days,
- does not allow an exposure level above those noted under Restricted Uses, provided that all applicable worker health and safety laws and regulations are followed during the alteration, improvement, or disturbance

4. Notice to Lessees and Other Holders of Property Interests.

(a) Owner shall cause all leases, grants, and other written transfers of interest by the Owner in the Affected Areas and adjacent to the Affected Areas to contain a provision expressly requiring all holders thereof to take the property subject to the use restriction and not to violate any of the conditions of this Declaration of Environmental Restrictions.

(b) Nothing contained in this paragraph 4 shall be construed as limiting any obligation of Owner to provided any notice required by any law, regulation, or order of any governmental authority.

5. Enforcement of violations. The restrictions provided herein are for the benefit of, and shall be enforceable against any person who knowingly violates this Declaration, solely by the Department. A violation of this Declaration of Environmental Restrictions, shall not have an adverse impact on the status of the ownership of and title to the Property. To enforce violations of this Declaration of Environmental Restrictions, the Department may initiate an action in Superior Court or as otherwise allowed by law against any person who is in any way responsible for a violation hereof and seek all available remedies, including without limitation, penalties and injunctive relief. Such enforcement proceedings shall not be initiated against past owners or operators who have not violated this Declaration.

6. Severability. If any court or other tribunal determines that any provision of this Declaration is invalid or unenforceable, such provision shall be deemed to have been modified automatically to conform to the requirements for validity and enforceability as determined by such court or tribunal. In the event that the provision invalidated is of such a nature that it cannot be so modified, the provision shall be deemed deleted from this instrument as though it had never been included herein. In either case, the remaining provisions of this Declaration shall remain in full force and effect.

7. Successors and Assigns. This Declaration shall be binding upon Owner and upon Owner's successors and assigns, and the Department, its agents, contractors, and employees, and to any other person performing remediation under the direction of the Department.

8. Termination and Modification.

(a) This Declaration shall terminate only upon filing of an instrument, executed by the Department, in the office of the Register of the County of Hudson, New Jersey, expressly terminating this Declaration.

(b) Owner may request in writing at any time that the Department modify or terminate this Declaration of Environmental Restrictions or execute termination proceedings based on, for example, the owner's proposal that the property does not pose an unacceptable risk to human health or the environment. Within 90 calendar days after receiving the request the Department shall either:

- i. execute the termination or modification Declaration; or
- ii. issue a draft notice of intent to deny.

The Department shall set forth in a draft notice of intent to deny the request its basis for its decision. The owner can respond to the draft denial by providing new or additional information or data. The Department shall review any such new or additional information and issue a final decision to execute the agreement or deny the request within 60 calendar days of the Department's receipt of the owner's response.

9. Owner has entered into, or is about to enter into an agreement to convey the Property to Motor Carrier Services Corp. ("Motor Carrier"), which conveyance will be subject to the restrictions described above and certain additional conditions, to be described in a deed from Owner to Motor Carrier (the "Deed"). Some of the terms of the Deed and this Declaration address similar subjects. Where possible, both are to be observed. However, in the event of any conflict or inconsistency between the terms of the Deed and this Restriction, the more stringent of the two shall apply.

IN WITNESS WHEREOF, Owner has executed this Declaration as of the date first written above.

ATTEST:

Monsanto Company

By: _____

[Print name and title]

[Print name and title]

STATE OF NEW JERSEY

COUNTY OF HUDSON

I certify that on _____, 1994, [Name of person executing document on behalf of Owner] personally came before, me, and this person acknowledged under oath, to my satisfaction, that:

(a) this person is the [secretary/assistant secretary] of Monsanto Company, the corporation named in this document;

(b) this person is the attesting witness to the signing of this document by the proper corporate officer who is the [president/vice president] of the corporation;

(c) this document was signed and delivered by the corporation as its voluntary act and was duly authorized;

(d) this person knows the proper seal of the corporation which was affixed to this document; and

(e) this person signed this proof to attest to the truth of these facts.

[Print name and title of attesting witness]

Signed and sworn before me on

_____, 19__

Notary Public

[Print name and title]

EXHIBIT A

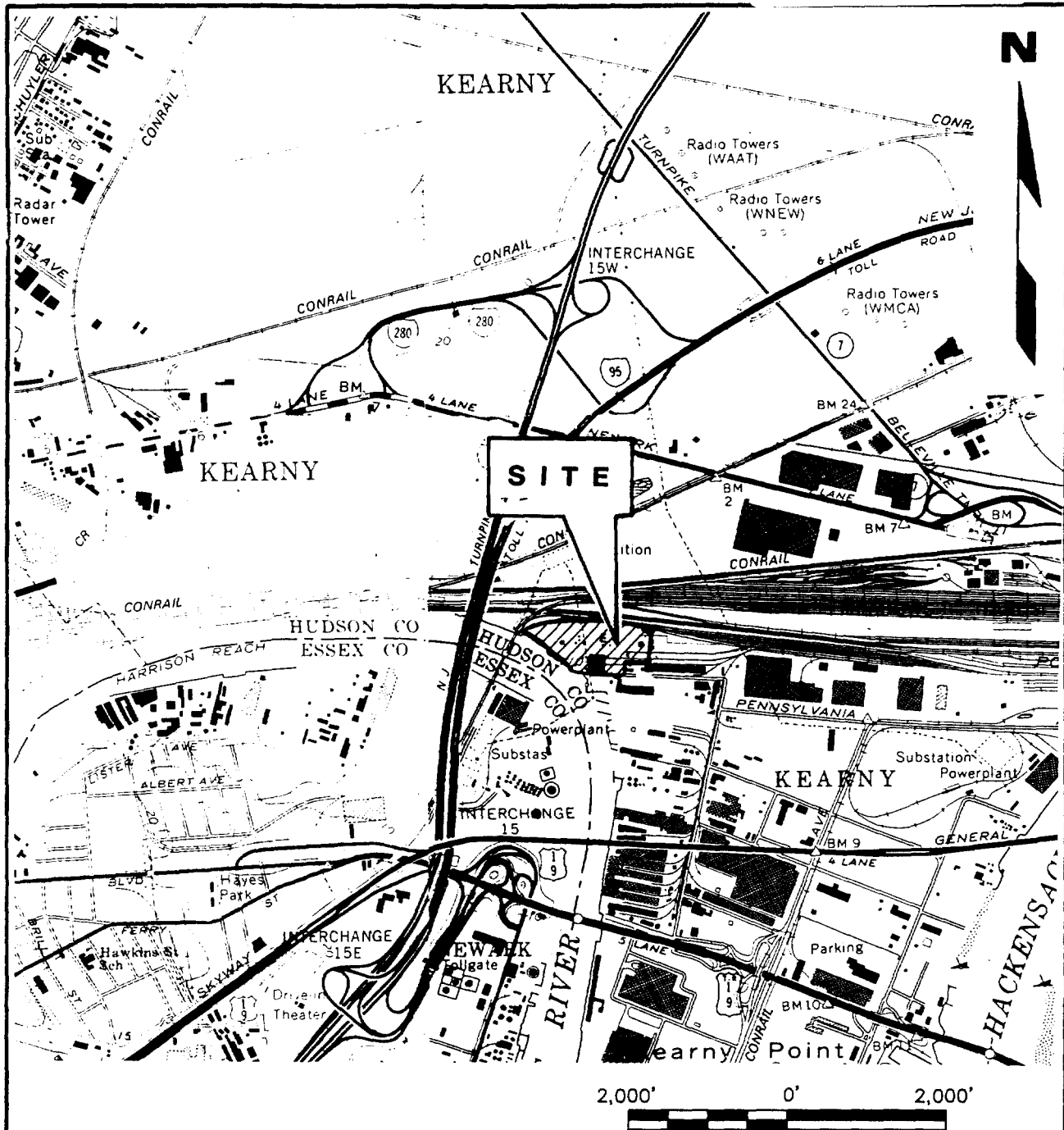
SITE LOCATION MAP (FIGURE A-1)

SITE PLAN WITH LOT AND BLOCK DESIGNATIONS (FIGURE A-2)

**METES AND BOUNDS DESCRIPTION OF
PROPERTY (INCLUDED IN DEED)**

**METES AND BOUNDS DESCRIPTION FOR THE
AFFECTED AREA (ASPHALT CAP)**

850131721



SOURCE:

U.S.G.S. ORANGE, N.J., QUADRANGLE 1955
 U.S.G.S. ELIZABETH, N.J., QUADRANGLE 1967
 U.S.G.S. WEEHAWKEN, N.J., QUADRANGLE 1967
 U.S.G.S. JERSEY CITY, N.J., QUADRANGLE 1967
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 PHOTOREVISED 1981

Title:

SITE LOCATION MAP

KEARNY, NEW JERSEY

Prepared For:

MONSANTO, COMPANY

ROUX
 ROUX ASSOCIATES INC
 Environmental Consulting
 & Management

| | | |
|---------------------|-----------------|--------|
| Compiled by: P.J.P. | Date: 10/94 | Figure |
| Prepared by: M.J.V. | Scale: SHOWN | |
| Project Mgr: P.J.P. | Revision: FINAL | |
| Proj No: 06634J | File No: | |

A-1

*** SAMPLE LETTER ***

November 11, 1994

Hudson County Register
Hudson County Court House
595 Newark Avenue, Room 105
Jersey City, New Jersey 07306

Re: Declaration of Environmental Restriction
Block 284, Lot 49
Pennsylvania Avenue, Town of Kearny, Hudson County, New Jersey
Administrative Consent Order Docket Number C-17649-88,
Former Monsanto Kearny Plant

Dear Madam or Sir:

Enclosed please find a Declaration of Environmental Restriction (DER) which will serve as a Deed Restriction for the above-referenced site and a check in the amount of \$58.00 to cover the cost of filing. The DER has been developed in accordance with the New Jersey Industrial Site Recovery Act (ISRA), P.L. 1993 c. 139. The DER is required to achieve ISRA closure by the current property owner, Monsanto Company. A future property owner has also provided approval of the implementation of the DER as the property is currently in the process of being sold.

The DER has also been accepted by the New Jersey Department of Environmental Protection's (Department's) Bureau of Site Remediation as an appropriate institutional control for a 136,300 square foot area known as the "Affected Area" on the above-referenced site. This area has been designated for environmental restriction and is referred to in the DER as the "Affected Area".

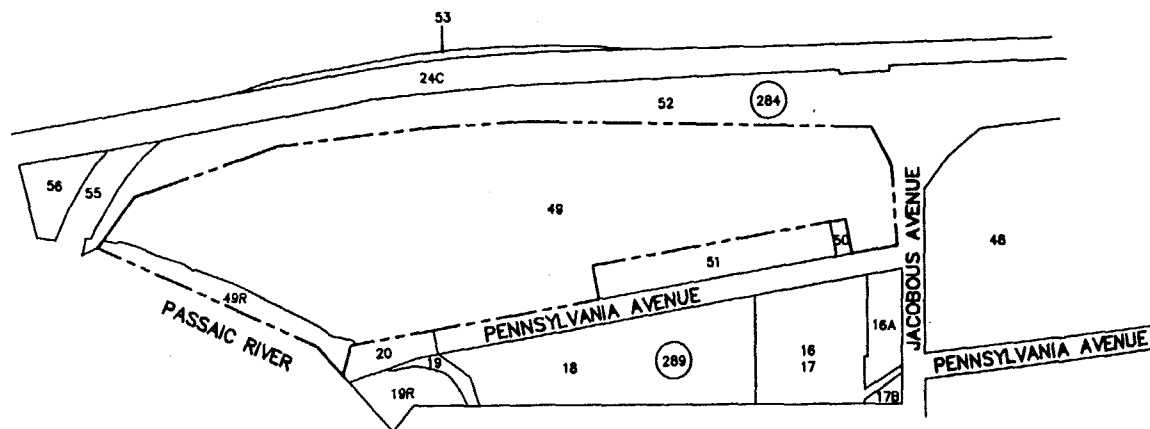
In addition to the implementation of the institutional controls, the Department required the implementation of engineering controls, in the form of an asphalt cap over the "Affected Area", prior to granting ISRA closure. The asphalt cap has been recently installed as a result of site remediation activities.

The executed DER is provided as Attachment 1 and includes Exhibits A and B. The contents of Exhibits A and B are described below.

850131722

MO06634J.6.2

N



REFERENCES:

1. REDRAFTED USING TAX MAP M7 DATED 10/5/92 TOWN OF KEARNY, PREPARED BY GERHARDT A. JOA-TOWN ENGINEER, KEARNY, NEW JERSEY.

LEGEND

| | |
|-------|---------------------------------|
| 16A | LOT NUMBER |
| (284) | BLOCK NUMBER |
| --- | BOUNDARY OF DEED RESTRICTED LOT |
| --- | LOT LINE |
| 49R | AREA SUBJECT TO RIPARIAN RIGHTS |

Title:

SITE PLAN WITH LOT
AND BLOCK DESIGNATIONS

KEARNY, NEW JERSEY

Prepared For:

MONSANTO COMPANY

| | | | |
|---------------------------------------------------------------------------------|---------------------|-------------------|------------|
| ROUX
ROUX ASSOCIATES INC.
Environmental Consulting
& Management | Compiled by: S.D.Y. | Date: 11/94 | Figure |
| | Prepared by: M.J.V. | Scale: SHOWN | |
| | Project Mgr: P.J.P. | Revision: FINAL | |
| | Proj No: 06634J | File No: 06634047 | A-2 |